DURING the past fifty months we have printed many articles on cold molding. We continue to do so, not just to fill space, but because we believe in the soundness of cold-molded materials. True, our belief has been questioned, and only recently, by men who are more in favor of the newer, light colored (and light weighted) materials. Their favoritism is not occasioned by any staggering successes in these newer developments, but is the result of long years of patient waiting during which their imaginations dwelt largely upon the new fields they would conquer if given one chance to utilize translucency. Now that this has been accomplished to some small degree, over-enthusiasm is leading them away from older products.

Cold molding has an important function that is almost a necessity. It will continue to be the utilitarian material, just as laminated sometimes is, in the electrical field especially. Not even the proposed six or eight cent "hot" molding powder will replace it, while its limitations may be many, its uses are too numerous to mention. And "cold" material is due to take on surprising color which will mean an even greater market. That is our sincere belief, sponsored by some knowledge of conditions and a recent study of sales.

It is almost a foregone conclusion, at least to us, that those molders who have been against cold molding—and those potential customers who have hung back—will return in greater number during the coming year. We do hear, however, that one large company may also use "hot" materials, but this would serve to increase cold sales, rather than decrease them. Therefore, as we said, we will continue to serve both interests in the degree they deserve.

The Publisher

PLASTICS & MOLDED PRODUCTS

A periodical devoted to the manufacture and use of plastic and composition products

Vol. 5 DECEMBER, 1929 No. 12

Contents

Cork as a Plastic Material 677

Another Combined Synthetic Resin and Cellulose Ester Plastic 679

The Cashew Nut Enters the Plastic Field, by Chas. W. Rivise 680

What Standardized Equipment Means To the Molding Industry, by Louis F. Rahm 682

The World's Recent Progress in Synthetic Resins, by Dr. Aladin 686

Unusual Applications of the Resinoids, by Chas. W. Rivise 690

Technical Abstract Section 692

MOLDED PRODUCTS—See Page 703

A Round-Robin Discussion on the Molders' Generic Name 703

Pyroxylin Sheeting Used in a Fine Art 705

The New Urea-Formaldehyde Molding Powders, by C. E. Slaughter 706

Casein and Vegetable Ivory Button Industries Still Compete, by P. Ch. Christensen 708

Molding the Clock Case, by H. S. Spenser 710

First Retail Molded-Ware Shop Opens in London 711

How Phonograph Record Ventures are Faring in Britain, by A. C. Blackall 712

News of the Industry 716

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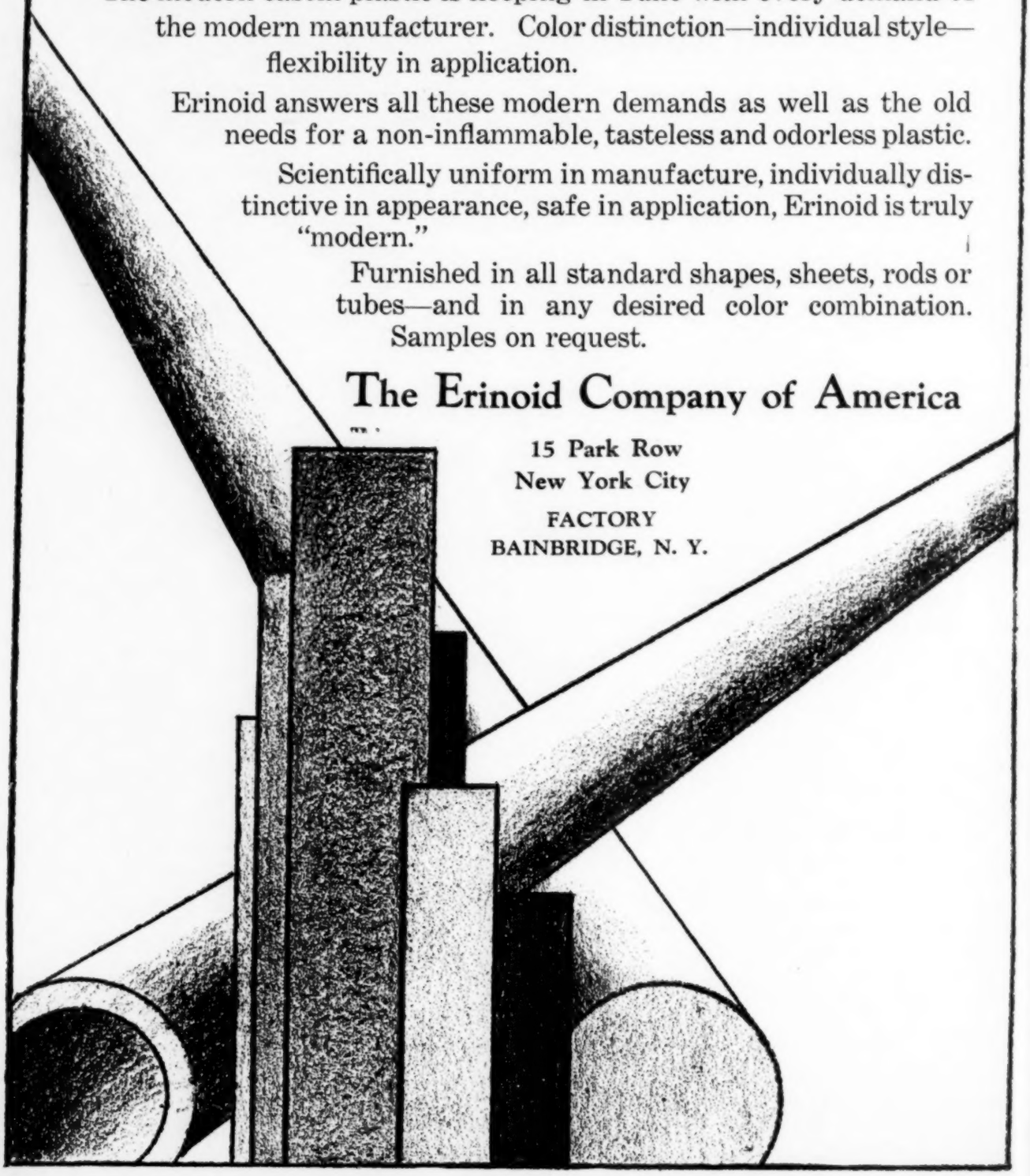

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PLASTICS

A periodical devoted to the manufacture and use of plastic and composition products

Vol. 5 DECEMBER, 1929 No. 12

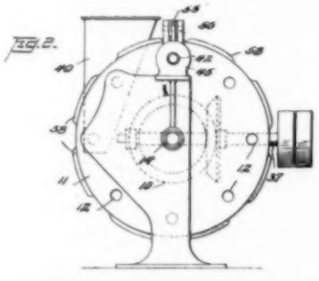
Cork As a Plastic Material

Natural as well as synthetic resins may serve as additional binding material. Preformed slugs cemented together.

THE bark of the cork tree has long been used industrially; not only in its natural form, but also as powdered cork in the manufacture of linoleum and similar products.

The molding of cork, by the aid of the natural resins therein contained, has also been frequently described. Recently, however, novel and distinctive combinations have been developed, in which cork particles or scales are used together with various synthetic resins as binders. The interest in these products is reflected also in the patented art.

Just a few examples of processes upon which their inventors were granted recent patent protection will show the trend of development in this field. The



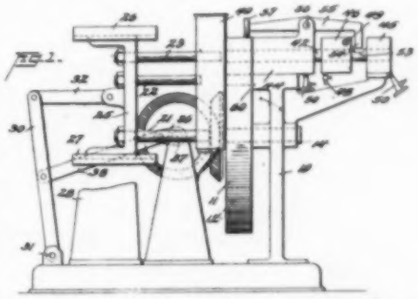
processes deal with the production of continuously extruded molded products made from cork and resins, as well as to the fabrication of very thin cork sheets and cork facings for laundry rollers and the like—quite a variety of applications.

The process involves the idea of continuously extruding molded phenol resin cork products.

There are so many interesting points of novelty in William G. Bond's method and apparatus for continuously extruding molded phenol-resin bound cork products, that we will describe the invention in full detail, as undoubtedly the process has other applications generally serviceable with moldable plastics. The data are taken from Bond's U. S. P. 1,716,293; June 4, 1929, in which he says:

"In the making of articles of comminuted cork the cork in small crumbs or particles have incorporated with them a binder of a type to set upon heating. It has been quite customary in the art to make this binder of glue or better still of a composition embodying glycerine, gelatine, water, paraffin and formalin, but I may prefer to use for this binder a phenol resin as this product coagulates nicely with heat and pressure and possesses water proof quality and non-inflammability as well as disinfectant properties, making cork articles in which phenol aldehyde is used, highly advantageous for use in refrigerators and elsewhere where the cork will be subject to dampness.

I place the cork and binder in a hopper and form a small slug of the material in a container of some kind preferably cooled by a circulating fluid such as water and then successively eject the slugs into a forming tube which is heated so that when the slugs are pressed into contact with those that have gone before they will unite so that the output of the machine is a continu-



ous rod which may afterwards be cut to size desired.

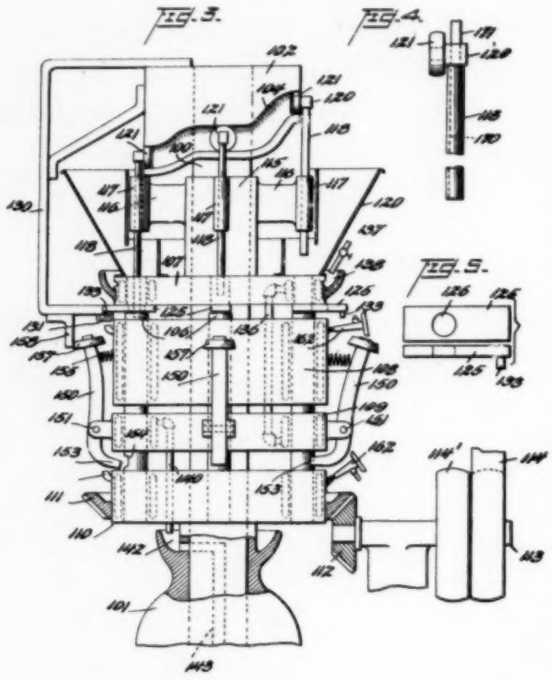
In my previous work in this art I have invariably had a

single heated zone and have chilled the last or exit zone of the tube, but I find that by adding a second heat zone and making this zone the exit one, I not only make possible a much greater production per hour but I secure a very much better product as the last heat zone reheats the peripheral surface of the formed or molded rod and leaves a zone of cooler material in the rod which zone even after ejection from the machine takes up heat from the still warm core and also from the heated peripheral surface thus eliminating the strain within the article, as the core will cool, because of this treatment, in approximately the same time as the surface.

In the form shown in Figure 1, a pedestal 10 pivotally supports a drum 11 which has therethru a plurality of holes 12 which may be of any desired cross section but being preferably cylindrical are so shown. This drum 11 may be water cooled if desired, in which case the inlet and outlet for the water jacket would pass through the pivoting shaft 14; as shown in the drawings, however, the drum is of sufficient size to radiate the heat at a sufficient rate to keep sufficiently cool and I have therefore not shown the water jacket although I should use such a device if the drum were made smaller.

Three plungers 21, 22 and 23 are bolted or otherwise rigidly wise rigidly secured to a cross head 25 sliding in cross head bearings 26 and 27 each supported from a bracket stand 28, the cross head receiving its movement from a lever 30 pivoted as at 31, connected to the cross head by a link 32, and connected to a crank 36 on the main drive shaft 37 by means of a pitman 38.

The three plungers are spaced from one another in such fashion as simultaneously to enter three consecutive holes or chambers 12 in the drum 11, the first preliminary packing plunger 21, being somewhat longer than the second preliminary packing plunger 22, serves to fill the chamber 12 with the comminuted cork particles having incorporated therewith the phenol aldehyde or other binder. It will be noted that these plungers 21 and 22 both pass through the hopper 40 but that the plunger 23, which ejects the slug of cork which has been packed in the hole 12 by the first preliminary packing plunger 21 and has been compressed by the second preliminary packing plunger 22, is located to one side of the hopper and discharges



the slug directly from the cavity 12 into a forming tube 42 which is axially alined with the plunger 23 and with the uppermost hole 12 of the drum, when the latter comes to rest between its intermittent advancing motions.

Surrounding the forming tube 42 at its entrance end is a heat jacket 44; at the exit end of the forming tube I provide a second heat jacket 45, and between these two I place a cooling jacket, 46, the latter preferably being water cooled, receiving the cold water from pipe 48 and discharging it in any convenient manner through the outlet pipe 49, either to a cooling means for return to the cycle or direct to waste if plenty of water is available.

The heat jackets may be formed in any way desired but I find it most convenient to use oil as the heating fluid and to apply the heat as diagrammatically indicated by the burners 50, direct to the walls of the heat jackets 44 and 45.

The forming tube has an orifice 53 rather snugly receiving the end 54 of a lever 55 pivoted as at 56 to the frame or to the initial heat jacket 44, this lever having at its far end a roller 57 operated by any one of a plurality of cams 58 on the periphery of the drum so designed and positioned that the end 54 of the lever will project into the orifice 53 of the forming tube each time the drum intermittently moves a step forward. The action of this lever is to retard or limit the travel of the formed rod of cork toward the exit end of the tube. Movement of the rod in the opposite direction, i. e. toward the entrance end of the tube, during travel of the drum is prevented by engagement of the continuous rod with the walls of the drum. Movement of the slugs to the right as seen in Fig. 1 is prevented by an arcuate guard 60 serving also as a backing against which the plungers pack the cork, and movement toward the left is prevented by engagement with the wall of the hopper until the respective cavity is nearly ready to be discharged.

In the form shown in Figure 3, the forming tubes are arranged so as to be vertical. They are preferably four or more in number and are carried in and by a rotating mechanism pivotally mounted on a rather large central shaft or column 100 secured to a floor base 101 and carrying at its top a non-rotat-

able cylindrical cam 102 having in its periphery a cam groove 104.

The four forming tubes 106 have their entrance ends just below a drum 107 similar in general to the drum 11 of the device shown in Figure 1, which ends are surrounded by a hot jacket 108, the tubes then pass through a second cooling jacket 109 and finally through the hot jacket 110 which surrounds the exit ends of the four tubes thru which the molded cork is discharged exactly as in the previously described device.

The four jackets 107 to 110 rotate as a unit, the driving means being for example, a gear 111 carried by the lower hot jacket and being driven from a pinion 112 on the short drive shaft 113 receiving its power from any preferred source as for example, from the belt 114 which drives the pulley 114 fast on the shaft 113.

Springs Eliminated

A hollow standard 115 having four radial arms 116 revolves with the jackets, each of the arms having a guiding sleeve 117 in which reciprocates a rod 118 carrying at its top an enlargement 120 to which is pivotally mounted a roller 121 which rides in the cam groove 104. Since there is little opposition to the raising of the plungers or rods 118 I may form the cam 102 as a hollow cylinder having its working cam surface at the bottom edge of the hollow cylinder but I prefer to eliminate the springs that would be required in such arrangement and I therefore form the cam surface as a groove, as shown.

In the modification shown in Figure 3 the rotation of the parts and therefore of the plungers 118 is continuous and not intermittent as in the device of Figure 1. The plunger shown at the right as seen in the figure is just starting to feed the comminuted cork and binder to the pocket of the drum 107 from the hopper 120, which it will be noted is conical in outside shape and which rotates with the jack-

(*Continued on page 694*)

Another Combined Synthetic Resin and Cellulose Ester Plastic

MORE and more complex products are being produced in the attempts to approximate the perfect plastic. The cellulose esters, with their comparatively high mechanical strength and excellent elasticity, have always been favored, but their high price has prevented their application in many fields where cost is an important consideration.

The synthetic resins, especially the practically colorless types, such as those derived from urea and formaldehyde, have also been favored. They, however, also did not possess all the desired properties. As a result of this condition, various attempts have been made to combine the cellulose esters with the synthetic resins, with more or less success.

A recent example of an actual complex plastic consisting of an urea formaldehyde—cellulose acetate—wood flour plastic is described in the U. S. Patent 1,721,742, of Clarence A. Nash; granted July 23, 1929, and assigned to the Bakelite Corporation.

This invention is a novel molding mixture preferably prepared by reacting urea and formaldehyde or their equivalents, in presence of filling materials including cellulose esters.

Cellulose Acetate Preferred

It is well known that urea and formaldehyde are capable of reacting to yield clear resins which become infusible when sufficiently heated; but the resins thus prepared do not function satisfactorily as binders for the usual fibrous or other fillers such as are commonly used in conjunction with reactive resins of the phenol-aldehyde type. By sufficient additions of cellulose esters, properly incorporated into the resin, this defect may be overcome. The molded products made from these novel mixtures by the standard procedures of hot-press molding are moreover superior in their surface characteristics and in their resistance to moisture. Cellulose acetate is used preferably, although the lower nitrates (corresponding to the di-nitro compounds) may be satisfactorily employed. Higher nitration products which are unstable at the molding temperatures of the order of 165° C. or somewhat higher are to be avoided.

Resin Condensed on Ester

The present invention is not limited to any specific composition of molding mixture or to any particular method of securing the necessary intimate incorporation of the cellulose ester into the resin. Preferably however the urea-formaldehyde resin is synthesized in presence of the cellulose ester, as well as of such inert fillers as may be employed.

For instance, a mixture is prepared comprising by weight:

	parts
Urea	94
Paraform	94
Cellulose acetate	32
Wood flour	100

The ingredients are thoroughly commingled in a ball mill or other mechanical mixing device, and then transferred to mixing rolls of the differential type and sheeted. The reaction whereby the resin is formed takes place largely or entirely during this sheeting operation, which is continued until the reaction is complete, as indicated by a loss of weight corresponding substantially to the water which is a by-product of this reaction. The sheets are broken up and pulverized in accordance with standard practice. The resulting powder may be molded under substantially the same hot-press conditions as are standard in the art of molding mixtures containing resins of the phenol-aldehyde type.

The Cashew Nut Enters the Plastic Field

Oil extracted from the cellular protective layer forms, with and without condensing agents, a variety of plastic materials

By Charles W. Rivise

THE cashew nut is the fruit of the evergreen tree known to botanists by that formidable name of Anacardium occidentale. The tree is native to and widely distributed in tropical regions including Brazil, the West Indies, India and the Pohang district of the Malay Peninsula. The nut has found considerable use as a substitute for almonds in confectionery. It contains about 45% of a pale yellow oil which is used to a certain extent in medicine and for coloring oils and fats.

Cake Rich in Albumin

The cake remaining after the extraction of the oil is rich in albuminoids. It might be expected, therefore, that the cake would be used as a substitute in whole or part for the ivory nut, albumin, casein and protein in the many patented processes for making artificial plastics from these starting materials. Among the patents disclosing such starting materials might be mentioned:—

Patent No. 1,061,346 to F. G. Wiechmann dated May 13, 1913

Patent No. 1,076,417 to B. B. Goldsmith dated Oct. 21, 1913 and

Patent No. 1,246,975 to S. Sato dated Nov. 6, 1917.

However, as far as the writer is aware, such use of the cashew nut cake has never been made.

Oil Used is Now Waste

The pericarp juice of the plant, i. e., the liquid contained within the cellular protecting layer about the kernel is a brown virulent oil consisting mainly of cardole and anacardic acid. This oil has been used in medicine and to protect furniture from ants, but on account of the lack of more possible uses large quantities have been thrown away. This wanton waste is no longer necessary according to Mortimer T. Harvey, who on August 27, 1929 was granted Patents 1,725,791 to 1,725,797 disclosing apparently feasible methods for converting this noxious oil into artificial plastics having as unique and varied applications as the well-known Bakelite.

The methods disclosed in these patents are based upon Harvey's discovery that the cashew nut shell liquid, which in its raw state is a non-drying oil, can be converted into either a rapidly drying oil or into resinoids by appropriate treatment. On account of the interrelation between these patents and the overlapping of their disclosures, the various methods suggested by the patentee will be set forth without reference to the particular patents in which they are disclosed.

First Method

Commercial cashew nut shell liquid is heated in any suitable manner to a predetermined temperature and is then permitted to cool. A condensation or polymerization apparently takes place and the liquid increases considerably in viscosity and drying power, depending upon the temperature and the duration of the heating. Driers such as litharge, manganese dioxide and hydrochloric acid, manganese resinate, copper oleate, copper ammonium hydroxide or copper carbonate driers or mixtures of two or more of them may be incorporated as well as gums, waxes, asphalts, pitches, ester gums, rosin, cumaron and oils such as linseed oil, China and Japan wood oils and fish oils.

The product can be dissolved in a carrier or vehicle such as gasoline, kerosene or varnoline and applied to cloth, paper, metal sheets or solid articles to protect them from moisture and chemicals such as caustic solutions, acids and solvents such as gasoline, kerosene, varnoline and alcohol. A peculiarity of the varnish made in this manner is that its drying is greatly accelerated when applied to copper or brass. This property can be utilized when coating containers of sheet iron by giving the sheet iron a superficial layer of copper before applying the varnish.

The varnish may also be used in making varnished cambric and paper for covering electric coils and cables. It can also be used to give chemical resistant coatings to containers made of paper, cardboard, wood, metal, glass, etc. Liners coated with the varnish may be inserted in the metal caps of food jars or the metal cup itself may be coated. The composition may also be used wherever linseed oil, tung oil and fish oils have hitherto been used, as, for example, in making molded electrical apparatus, linoleum, oil cloth, separators for rubber sheets and for conditioning rubber.

Second Method

Heat the nut shell liquid and at the same time blow air through it until the temperature reaches 450° to 600° F; cool and add gasoline or varnoline. This composition can be dried in an oven at from 100° to 200° C with or without driers or in the air at room temperatures. Continued blowing of air through the liquid results in a rubbery sub-

stance which can be dried into thin sheets or can be mixed with powdered sulphur or other vulcanization agent to obtain cured material or to make molded products.

Third Method

Cashew shell oil is treated with an oxidizing agent such as nitric acid. The reaction is strongly exothermic and produces a gum having a very low iodine number. The product may be dissolved in amyl acetate, benzine gasoline, turpentine, alcohol, naptha, kerosene, etc., and can be used for paints, varnishes, molded compounds, electrical insulation, for making finishing materials, waterproofing, insulating tapes and adhesive tapes and for impregnating paper and woven fabrics.

Variations consist in using nitric acid and hydrochloric acid, or hydrochloric acid with manganese dioxide, or nitric acid with manganese dioxide or sulphuric acid or an acid with potassium dichromate as the oxidizer. The color can be varied from a nearly black through the reds and browns to a light yellow by varying the amount of the oxidizing agent.

Fourth Method

Cashew nut liquid is heated with copper, aluminum, lead, or oxides, hydroxides, carbonates, oleates or stearates of these metals. For example, nine parts of cashew shell oil by weight and one part of cupric carbonate are heated for about an hour at a temperature of about 140° C at atmospheric pressure. The product is separated from the reaction mixture and made into a varnish or lacquer by dissolving in benzol, naphtha or alcohol. The varnish may be applied to paper or fabric or to wire coils and baked thereon to produce an electrical insulating material.

Fifth Method

The cashew shell liquid is caused to react with a metal such as copper, nickel, Monel metal, lead, magnesium, calcium or manganese to change its characteristic from non-drying to drying. As an example, the raw oil is heated at 100°C in a copper vessel to drive off the moisture; the temperature is then raised to about 200°C and the heating continued from about one-half to eight hours to get the desired consistency. Pressure may or may not be used. If the oil is heated less than three and a half hours no solvent is needed to make the composition suitable for coating. Other oils such as linseed oil, and tung oil and resins such as cumaron may be added to the composition. The composition may be used for the same purpose as those made by the other methods and also to waterproof fabrics, cords, lines, papers, etc.

Sixth Method

Cashew nut oil is caused to react with formaldehyde, paraform, acetaldehyde, paraldehyde, benzaldehyde, furfuraldehyde or hexamethylenetetramine under suitable conditions of temperature and pressure with or without driers and catalysts. Examples of catalysts acid gums such as manganese resinate, rosin, etc.; acids, as nitric and hydrochloric; alkali, as ammonia, lime, soda, baria; oxygen containing metal compounds such as copper oleate, copper carbonate, copper ammonium sulphate and copper ammonium hydroxide and metals such as copper and nickel. The aldehyde is preferably formaldehyde which may be in solution or gaseous form. The cashew oil may be either cooked or raw and the aldehyde may be added at room temperature or at any time before the preheated oil reaches room temperature. The product may be dissolved in a solvent such as gasoline, kerosene or varnoline. A variation consists in carrying out the reaction in the presence of a solvent to prevent the reaction going to the infusible stage. Other oils such as linseed oil, tung oil and fish oil may be added to the cashew shell oil.

Seventh Method

The reaction between the cashew shell liquid and the aldehyde is made to take place in a solvent such as phenol, cresol, or resorcinol which act as retarders in the same way as do the volatile solvents. This is especially so when the alkali is present in great excess. If the aldehyde is not present in excess the phenol enters into a reaction with the excess cashew nut oil to form a cashew shell liquid —phenol — aldehyde condensation product. Thus equal parts by weight of the three substances may be caused to react at about 330°F; allowed to cool and dissolved in varnoline to make a varnish. A variation consists in mixing cashew nut shell liquid condensation product with a phenol formaldehyde condensation product to produce a flexible and pliable resinoid.

The Process' Possibilities

The advantages of these condensation products can best be described in the language used by the patentee:—

"—possibilities exist with the use of the cashew shell oil which are unheard of in the "bakelite" and allied arts as heretofore practiced. One of these results is the use of synthetic resins and lacquers of this nature where it was prohibitive in price, because now there can be used the millions of gallons which are formed yearly by the growth of the nuts.

"Another result is the possibility of new uses for resins of this nature. These new uses are possible because of the occurrence of this oil in the liquid state and with molecules, as I find, having a great number of groups which are very active toward aldehyde compounds. This, I further find, makes it possible to stop the condensation reaction of the oil at desired states of fluidity thereof, as it changes from the liquid state to the completely condensed or solid state. The liquid is then used as it is for lacquers or other purposes or else it is ap-

(*Continued on page 698*)

What Standardized Equipment Means to the Molding Industry

By Louis F. Rahm

AS an improvement in the efficiency of the molding industry as a whole, and probably second only to a protective union in importance, is the matter of standardization of molding equipment.

In the field of molding presses for example, it seems proverbially true, that no matter how extensive the line may be, which the manufacturer is offering, the customer always wants something different, while a standardized product would suit his needs in about ninety percent of the cases. In the early days of the industry, the customer was almost obliged to purchase press equipment designed especially to suit his needs for a particular job. Later, this same equipment would often be found unsuitable for other work, owing to one or more features in construction which either could not be altered at all, or only at prohibitive expense. Where a little forethought in design and possibly a few dollars more in first cost would have provided a machine adaptable to a wide variety of uses, the customer has been handicapped by buying shortsightedly, special equipment.

Some Specialties Dropped

Of later years, since equipment manufacturers have developed various lines of presses especially for the molding trade, some of the evil of specialized equipment has been eliminated, but the subsequent growth of the industry has pointed the need for standardization in the newer lines.

This standardization might well begin with that all-important molding press,—the semi-automatic, as regards just what a buyer may expect to get in buying one. Some builders offer them complete, others offer only skeletons, which require considerable outlay of money for accessories, to be rendered useful. It would appear reasonable at this time that ejectors no longer be considered extras, and that positive bottom ejection be considered an inherent part of the press, while upper ejectors will very likely be added as standard, before long.

Considering press sizes, a great deal of simplification is possible here, since the majority of semi-automatics are from 75 to 100 tons capacity. Built in these sizes, there is no positive need of an intermediate size, while from 100 tons upward, the capacities might be increased by 50 ton increments, with the possible addition of a 125 ton size.

Unit Pressures and Mold Proportions

While it is patently impossible to set single standard, regarding hydraulic line pressures, the buying of equipment for odd pressures should be discouraged by the manufacturer, whenever possible, in the hope that eventually we may consider 2,000, 3,000, and possibly 4,000 pounds per square inch as standard.

With the general mold sizes fixed, as above, by standard press capacities, the next desirable change lies in the proportioning of the mold. The last few years have proven beyond doubt, that on production work, the most efficient shape of multi-cavity mold is long and relatively narrow. The width is limited by the distance an operator can conveniently reach, while the length is determined by the number of mold impressions desired. For any given size of mold there is generally a best proportion between these two dimensions, and press platens should be standardized to suit. Thus a molder will have the assurance that a 75 ton mold will fit into any 75 ton press he may have available. While this in itself would be a great convenience, it would also be a great economic advantage, as for example, in the case of a mold which may be used in various molding shops.

Ram Stroke and Types of Ejector

With press capacities and platen-size and shape standardized, the stroke of the press-ram should be determined at a reasonable maximum, in each case, to suit the exceptional though not special job. While this stroke can not be calculated, it can easily be determined by experience and judgment.

Beyond this, the matter of ejectors is worthy of consideration. While we find here a wide variation in types, with the chances of such variation persisting for some time to come, the tonnage of the various forms could at least be standardized easily by fixing a certain percentage of the press capacity as the proper tonnage in each case.

It is only through such standardization that the startling present day price variations in equipment will disappear, — when any certain type of press is definitely understood to have certain fundamental features included. Thus only will manufacturers be on an equal footing in offering their equipment, and the unwary buyer be protected against buying an incomplete machine in which his present molds may not fit.

WOULD YOU RATHER FAGE A UNIGORN or A DILEMMA?

THESE antique animals are both in our office. We have fed the first with well-cured Editorial Hay, until he is sound and kind. We call him, in jest, "Ed. Policy".

Down the hall, and up two fire-escapes to the 84th floor, you get to the Den of the SUBSCRIPTION MANAGER. Here he keeps his little two-horned pet DILEMMA (you bet, he keeps it there; we Editors and Co-respondents —as Chick Sale says—don't want any wilder beasts than we have to handle); and from latest reports the thing is as fierce as when we caught it in 1928. The S. M. calls it his "Do-Or-DILEMMA".

THIS is his problem. It is our own, and yours also, you who really make PLASTICS by having built those needs that we are doing our best to fill. And it is:

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To Test That Second Alternative

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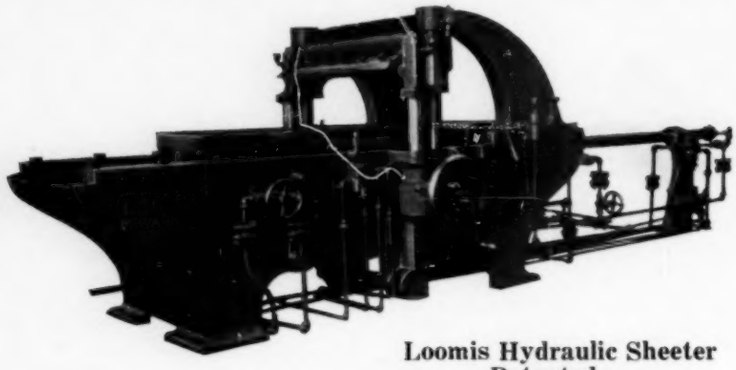

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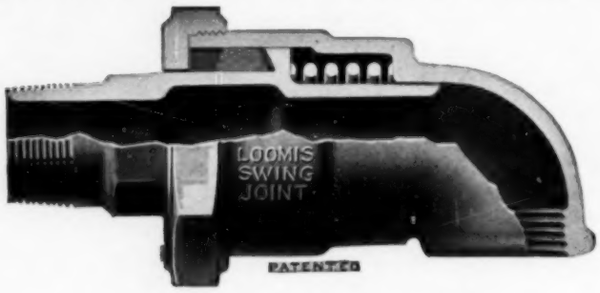

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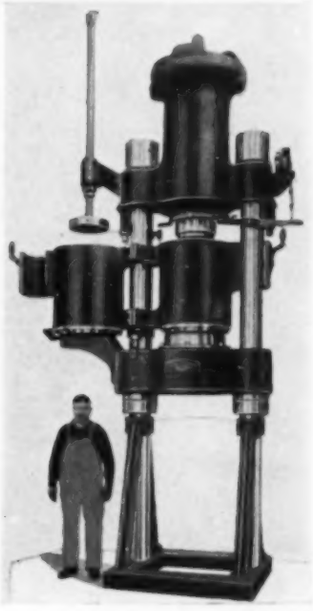

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The World's Recent Progress in Synthetic Resins

A complete and condensed account of patents from the most important industrial countries

By Dr. Aladin

The patents that are listed here are all of recent origin and disclose the progress realized throughout the civilized world in this field. The dates, except in case of U. S. patents, are those of application. There will be a total of over 450 patents in this review. Publication began in April, 1929.

5. Utilization

(Continued from November Issue)

Serial No.	Patent Number and Date	Inventor or Assignee	Title of Invention	Subject Matter of the Patent
169	Brit. P. 265,334	V. Lefebure	Decorating paper	By means of transfer rolls or stencils, phenolic resins are applied to paper. These are then hardened by heating the paper to 150°C. If urea-formaldehyde resins are used, 130°C. suffices. Colors to suit may be added.
170	Brit. P. 265,566	J. K. Wirth and Saureschutz G. m. b. H.	Containers made from artificial resins	See German P. 466,429 (No. 163).
171	Brit. P. 272,478	Kirchbach'sche Werke; Kirchbach & Co.	Friction material for clutches and brakes	Gray cast iron borings or filings, or aluminum filings and borings are mixed with loosely woven asbestos that has been impregnated with phenolic resins.
172	Brit. P. 273,756	L. Levy (To Societe Levy, Samuel et Levy)	Lacquer or varnish	Sulfonated condensation products of the phenol-aldehyde type are dissolved in such solvents as alcohol, furfural, nitrobenzene, naphthalene, acetone, cylohexanol etc., and the solutions employed as a varnish.
173 174	Brit. P. 274,333 Brit. P. 274,355	K. Loos, M. Lehnig, C. Hennig and R. Dassdorf	Coating compositions	These consist of mixtures of phenol-formaldehyde resins with water-glass (sodium silicate) with or without the further addition of silica compounds or of clay or metallic oxides. The coatings obtained therewith are resistant to the action of chemicals. See also French Patent 641,349 (No. 201).
175	Brit. P. 275,011	G. L. Peakes (To Bakelite Corp.)	Molded phenol resin insulation	See U. S. P. 1,602,249 (No. 146).
176.	Brit. P. 276,440	Products Protection Corp.	Preparing plastic masses from phenolic condensation products	Pulverized intermediate reaction products, after complete drying, are immediately placed into molds and hardened therein by heat.
177	Brit. P. 278,460	E. J. Hole	Printing plates	Cellulose is mixed with a water soluble phenol-formaldehyde condensation product to which a bichromate has also been added. The resultant mixture is pressed against the set up of type, at elevated temperature, whereby the condensation product hardens and forms a matrix from which stereotypes can be made.
178	Brit. P. 283,868	H. Traun & Söhne, vorm. Harburger Gummikamm Co.	Containers for acids.	Containers suitable for storing hydroflouric acid etc. are either made entirely from phenolic resins, or are coated therewith. Graphite may be added also.

Serial No.	Patent Number and Date	Inventor or Assignee	Title of Invention	Subject Matter of Invention
179	Brit. P. 285,058	Gesellschaft für Chemische Industrie	Light-proof lacquers	To produce colored resins, which contain a dye that resists the reactions taking place on heating the resins to harden the same, dyes of the following groups are employed: mono-azo dyes from negative, substituted, non-sulfonated diazo compounds coupled with substituted or unsubstituted amines that couple at a position para to their amino group.
180	Brit P. 286,305	Manufacture de Machines Anseiliaires pour l'Electricite-et l'Industrie (Soc. Anon.)	Impregnating articles with phenolic resins.	The dried objects are impregnated with solutions of phenolic resins and are subsequently heated to polymerize and harden the same.
181	Brit. P. 288,303	R. Arnot Elektrochemische Fabrik; Dr. Brandenburg and Weyland	Preparation of lustrous acid and alkali-proof surfaces.	The articles are coated with a fluid synthetic resin, and are then heated under pressure to harden and insolubilize the latter.
182	Brit. P. 291,474	Tootal Broadhourst Lac Co. Ltd. (B. P. Fouldr, J. T. Marsh and J. C. Word)	Impregnating cellulosic fibers with synthetic resins.	The fibers are impregnated with phenol and with formaldehyde in the presence of alkaline or acid condensing agents, and heated; the resultant phenolic resin is then further hardened by heating to 180° C.
183	Brit. P. 291,477	Dunlop Rubber Co. Ltd. (R. C. Davies)	Electrophoretic preparation of articles from artificial or from natural resins.	Phenolic resins, which may be insoluble, are dispersed in water containing ½% of ammonium hydroxide, 2% of gelatin and 2% of casein. The resultant emulsion is combined with a similar solution, free from resins, but containing formaldehyde. To the mixture thus resulting, some castor oil or linseed oil is added, followed by the further addition of an aqueous ammoniacal solution of shellac. The article to be coated or formed are made the anode, and an electrical current is passed through the mixture whereby the resin, in insoluble form, is deposited on the anodes.
184	Brit. P. 292,636	G. Petrov	Coloring articles made from phenol-formaldehyde products.	In order to protect hardened phenol-formaldehyde artificial resins against the destructive influence of air and light, they are treated with a 1 to 2% solution of an organic dye.
185	Brit. P. 292,637	G. Petrov	(Same as 184 being an addition thereto).	The colored artificial resins made in accordance with the main patent are treated with aqueous solutions of phenols, sulfonic acids or sulfonated oils.
186	Brit. P. 295,228	C. Baucarel	Sound record.	Paper discs are dried by heating in a vacuum, and are then impregnated with an alcoholic solution of a phenolic resin, and then heated to 150° C.
187	Fr. P. 609,850 Addition 31,708	E. D. de Bielize	Artificial marble and the like.	The marble-like products obtained according to the methods described in the main patent or in the additional patent are treated with phenolic resins or with aminoplastics.
188	Fr. P. 611,264	Bakelite Ges.	Impregnating porous materials with artificial resins.	Saw dust or the like is mixed with a colloidal solution of phenolic condensation products in water, and is then dried by centrifuging and dried. The resultant product may be molded, or employed for coating other objects.
189	Fr. P. 616,505	Products Protection Corpn.	Manufacture of plastic masses from phenol-formaldehyde condensation products.	See British Patent 276,440 (No. 176).

Serial No.	Patent Number and Date	Inventor or Assignee	Title of Invention	Subject Matter of Invention
190	Fr. P. 617,424	Amalgamated Dental Co., Ltd. (S. W. Wilding)	Production of artificial teeth.	See British Patent 260,319 (No. 167).
191	Fr. P. 618,742	Selden Co.	Plastics from resins.	Fusible resins of the phenol-formaldehyde type are melted with phthalic acid esters until the resins have become infusible.
192	Fr. P. 620,144	Bakelite Corp. (G. L. Peakes)	Preparation of molded phenol resin insulation.	See U. S. P. 1,602,249. (No. 146).
193	Fr. P. 621,736	Societe anon. des Manufactures des Glaces et Produits Chimiques de St. Gobain, Chauny et Cirey	Cementing broken glass.	The edges of the broken pieces are coated with a phenolic resin and then heated to render the latter infusible.
194	Fr. P. 623,535	G. A. Lacrouse	Preparation of synthetic resins by condensing phenols with aldehydes.	Phenolic resins are mixed with chalk which is then neutralized with lactic acid, with or without the addition of sodium thiosulfate. This forms a white, alkali-soluble resin, which by the addition of various other substances can be altered in its nature.
195	Fr. P. 629,644	Stabilamenti Chimici Industriali	Preparation of flexible, elastic impermeable substances resistant to acids, alkalies and solvents.	Cellulose or cotton waste (such as linters) is treated with weak sulphuric acid containing some nitric acid, and is then stirred into liquefied phenol; formaldehyde and soda are added, and the resultant mixture is heated to 90° C. Until a uniform paste results., This can be molded and may be indurated by heating to higher temperatures.
196 197	Fr. P. 633,540 Fr. P. 633,541	Felten & Guilleaume Carlswerk A.-G.	Preparation of insulating paper.	A mixture of a phenolic resin solution, or of its components such as phenol and formaldehyde, in admixture with a paste made from cellulose fibers and alcohol, is run into water, whereby the phenolic resin is precipitated upon the fiber. The thus impregnated fiber is separated, sheeted and dried, and may be hardened by heat so as to yield insulating paper and cardboard.
198	Fr. P. 635,399	J. K. Wirth	Constructional elements made from acid-proof material.	As a cement for fastening together and rendering liquid-tight plates of metal etc., phenolic resins of a type that become infusible in the cold by treatment with acid or by heating, are employed.
199	Fr. P. 636,348	C. Klingspor	Preparation of waterproof and insoluble emery paper	Parchment paper, or paper that has been dipped in wax or stearin is subjected to treatment with a glue solution also containing a phenolic resin and some glycerin. Emery powder is then sprinkled onto the paper which is then dried and slowly heated to 140° C. A soft abrasive paper is thus obtained to which the emery clings tightly.
200	Fr. P. 637,721	Societe "Tamala"	Heat insulation made from Bakelite and cork.	Bakelite, cork and fillers are mixed together and the resultant mixture is applied to the surfaces that are to be provided with the heat insulating coating; on which the mixture is hardened by heating.
201	Fr. P. 641,349	M. Lehnig	Coatings from artificial resins, resistant to chemicals.	Intermediate still fusible phenolic resins are mixed with an emulsion of sodium silicate, clay and powdered quartz. See also British Patent 274,-333 (No. 173) and Brit. P. 274,355 (No. 174).
202	Fr. P. 641,778	G. Viaud	Use of Bakelite as a construction material for ships.	Bakelite is employed as a constructional material for building ships etc.

Serial No.	Patent Number and Date	Inventor or Assignee	Title of Invention	Subject Matter of Invention
203	Dutch P. 16,542	W. Tod Jr. & Co. (1923 Ltd.)	Articles from phenol-formaldehyde condensation products and cellulose.	See Norwegian P. 41,228 (No. 75).
204	Dutch P. 16,543			See Norwegian P. 41,228 (No. 75).
205	Norweg'n P. 44,578	J. R. Kohler	Pressed articles made from resite, resinites or other artificial masses.	Very finely ground and bolted beech-wood powder is used as a filler.
206	Austrian P. 108,159	Kabelfabrik und Drahtindustrie A.-G. (A. Roth)	Waterproofing paper pulp articles.	On a regular paper machine, alternate layers of incipient paper and of a phenolic condensation product are united. The material thus formed may be used as a basis for matrices for stereotypes or for preparing an electrical insulating material.
207	Austrian P. 108,680	Resan Kunstharzfabrik A.-G.	Production of objects of art.	Transparent or translucent fluid phenolic condensation products are cast over a form made from an easily fusible metal and then hardened; after which by slight further heating the metal is liquefied and poured out of the formed object, leaving it hollow. The hollow may then be filled with any suitable material or left as it is.
208	Swedish P. 60,733	Ferods Ltd. (H. Frood)	Preparation of masses suitable for brake-shoes and brake-bands.	Pulverized resinous condensation products of phenols with formaldehyde are mixed with powdered fibrous materials such as asbestos, wool, hair, cotton, cork or even kieselguhr, compressed in molds and hardened by heat. In order to increase the heat-conductivity of the material the fibrous materials may prior to their incorporation with the resin be saturated with solutions of metallic salts such as copper sulfate, aluminum sulfate, iron sulfate and the like.
209	Swiss P. 103,222	J. Wirth	Forming resistant coatings on iron or other metallic surfaces by use of phenol-formaldehyde condensation products.	In order to coat pipes and other uneven metallic articles, their surface is first roughened and then wetted down with liquefied condensation product. The regular coating is then applied and hardened in accordance with prior patents of the same inventor; i. e. by heat under pressure as usual.
210	Swiss P. 113,739	R. Arnot	Preparation of adhesives cements and plastics.	Phenols or phenolic substances in admixture with aldehydes or substances capable of yielding the latter are mixed with proteids in the presence or absence of protective colloids or of oil or fat emulsions.
211	Swiss P. 119,461	Säureschutz G. m. b. H.	Containers resistant to chemicals.	The vessels are provided with depressions which are filled with a phenolic resin. The entire inside of the vessels is then coated with a similar material and the surface thus produced hardened by heat; thus holding the material tightly to the metal.
212	Swiss P. 123,045	Bakelite Corp. (G. L. Peakes)	Preparation of molded phenolic resin insulation.	See U. S. P. 1,602,249. (No. 146).
213	Swiss P. 126,457	Minnesota Mining and Mfg. Co.	Disc-like abrasive means and their preparation.	A condensation product of phenols and formaldehyde, produced either with acid condensation products or with ammonia as a catalyst is applied in the liquid state, to sheets of paper. A suitable abrasive substance in powdered form is then applied to the paper, combining with the resin thereon, which latter is then hardened by heat, yielding an abrasive paper.
214	Swiss P. 127,039	L. Levy	Preparation of lacquers, varnishes and enamels.	Sulfonated phenolic resins are employed while dissolved in suitable solvents.

This concludes the resume of the phenolic resins. The next portion of this review begins in January with Resins from Hydrocarbons.

Unusual Applications of The Resinoids

How they are applied to the fabrication of washing machine impellers, filtering media, gas-absorbing media and pyrotechnics

By Charles W. Rivise

This completes the very unique compilation of the lesser known, and hence more interesting applications of resinoid plastics culled from the author's large collection of U. S. patents on this subject.

The use of a molded phenol resinoid for the agitator or dolly of a washing machine was first suggested by J. Rocke in Patent 1,617,030 dated February 2, 1927 (Reissued as Patent 16,-743 dated September 20, 1927.) The patentee claims that such an agitator is much more serviceable than one made of wood or metal in that it does not rot, corrode or become warped. In addition thereto it is claimed that the lightness of the dolly cuts down on the power and makes for noiseless operation. The Patent Office officials, however, considered these alleged advantages to be nothing more than the natural and obvious results of the change in material and refused for a time to grant a monopoly on this idea. They were finally presuaded that pattentable novelty was present by affidavits of several disinterested people to the effect that a molded resinoid propeller wears off only one sixth as much lint from towels as does the metallic propeller of the prior art. However, it has been found in practice that the periphery of the impeller becomes dented from rough handling and as a result the Meadows Washing Machine Co., which owns the rights under the patent, is putting out an alternative form of dolly in which only the baffles or vanes are molded of resinoid material.

Filtering Media

E. J. Sweetland, F. W. Manning, W. S. Hilpert and H. C. Martin have made valuable contributions by teaching the art how to make filtering media utilizing artificial plastics. Thus in Patent 1,292,535 dated January 28, 1919 a foraminous metal base consisting of Monel metal, brass, or copper is coated with a phenolic resinoid and baked. The coating may be accomplished by dipping and the excess gotten rid of by draining, centrifuging or suction. The metal wires may be coated before being woven into wire fabric and the condensation product may be partially cured before weaving an another coating applied after weaving.

A filtering medium particularly adapted for acid solutions including hydrofluoric acid is described by H. C. Martin in Patent 1,576,440 dated March 9, 1926. Silicon carbide or other granules such as silica, garnet. fused alumina, fused magnesia, fused aluminum silicate, glass or other highly refractory natural or artificial crystalline mineral substance is mixed with a resin solvent such as furfural, mixed with a phenolic resin in powdered form, molded and baked. The plate may be molded flat and curved before baking.

Steering Wheel

H. S. Morgan and H. N. Copeland have suggested making stering wheels for automobiles from an artificial plastic. The former in Patent 1,220,877 dated March 27, 1917 builds up a rim of filler strips such as wood, embossed sheet metal or other suitable material, preferably of a permeable material of fibrous or porous texture and molds a coating of phenoplastic thereabout under pressure to permeate into the pores of the filler strip and to be forced between said strips. Copeland preforms a granular composition of intermixed colors into a tablet by cold pressing and applies pressure thereto in a mold to produce different striate, rayonnant or blurred effects according to the shape and size of the tablet or by the shape and contour of the mold. For example a cylindrical tablet may be placed on a smaller cylinder or the male portion of the die may have a recess in its surface to allow fo: flow of material. However, Copeland does not disclose how he intends making the product into a steering wheel.

Gas Absorptive and Decolorizing Material

One of the most unexpected and unobvious applications for a phenol resinoid is its use as a gas absorptive and decolorizing material, suggested by L. Wallerstein in Patent 1,442,372 dated January 16, 1923. The patentee condenses a phenol such as cresol or resorcinol with formaldehyde in the presence of sodium hydrate. Charcoal or

other carbon may be added to the mixture, which after standing at room temperature is dried to drive off uncombined reagents and then carbonized. The product may be cheapened and its porosity increased by adding infusorial earth to the phenol condensation product or to a mixture of such product with carbon. The carbonizing may be carried out under pressure especially if cresol is used as the phenol. The carbon should be selected according to its absorptive, decolorizing or other desired product. The product may be molded into pencils or cylinders prior to drying and heating. A possible variation consists in impregnating wood with the phenol condensation product and then carbonizing it.

Temporary Ceramic Binder

E. Anderson in Patent 1,458,376 dated June 12, 1923 utilizes a dry pulverized resin as a temporary binder for ceramic products such as filtering plates, abrading wheels or storage battery separators. A basis material such as aluminous oxide, a vitrified bond such as vitreous clay and a dry pulverized phenol resin are mixed, molded into plates under heat and pressure, embedded in quartz sand and heated until the quartz fuses and the phenol resin is driven off. The resin serves to carry the bonding material into the smallest interstices of the mass leaving the larger interstices vacant so that the plate contains an intricate system of tortuous foramina extending through the plate from one side to the other.

This application developed by Anderson could hardly be expected of a phenolic condensation product from its known properties. Obviously the temperature employed must be very much higher than that used by Wallerstein in Patent 1,442,372 to carbonize the product and produce a gas absorptive and decolorizing material.

Self Lubricating Bearing

W. H. Kempton in Patent 1,430,560 dated October 3, 1922 makes a self lubricating bearing in the following manner:—

Sheet material such as paper, duck, or muslin is perforated to a certain extent of its length after which it is impregnated with a phenolic condensation product; the perforations are filled with a lubricant such as graphite with or without a resinoid binder; the sheet material is wound into a tube and the assembly cured in a mold with heat and pressure. The perforations may be circular or rectangular openings staggered throughout the area of the fabric or trapezoidal in shape arranged diagonally along the sheet or some may be rectangular openings extending substantially the width of the fabric with others extending partly along the length.

In Patent 1,400,148 dated March 14, 1922 V. G. Apple makes a self-lubricating bearing in the following manner:—

Graphite is mixed with phenol condensation product in liquid or powdered form and applied to one side of foraminous material preferably wire cloth or coarse mesh fabric of cotton or linen or window screen cloth. Coated fabric is rolled into helical cylindrical form with the inner convolutions much smaller in diameter than the ultimate diameter of the bearing. The cylinder is positioned in a die and a plunger having a pointed end is forced into the cylinder to enlarge the inner diameter of the cylinder to the size required for the finished bearing and to force the lubricant into the meshes of the material. The cylinder is then baked. Some of the powdered compound may be placed within the center of the hollow cylinder and forced into the material by the action of the pointed plunger.

Artificial Silk

Several inventors, notably W. A. Beatty and E. Bronnert have disclosed and patented methods of utilizing artificial plastics in the manufacture of artificial silk. It is interesting to note that both patentees mix the artificial plastic with either viscose or a cellulose ester. Thus Beatty in 1,156,959 dated October 19, 1915 makes dioxy-diphenyl-dimethyl-methane from phenol and acetone in the presence of a mineral acid catalyst such as hydrochloric or sulphuric acid, mixes the product with cellulose acetate or nitro-cellulose, dissolves the mixture in acetone and makes a filament by squirting the mixture through capillary orifices into a benzene bath.

Bronnert in Patent 1,374,718 dated April 12, 1921 dissolves the interaction product of phenol and formaldehyde in caustic soda solution, adds viscose thereto and spins the product in a bisulphite bath. The thinness of the thread is controlled by varying the concentration of the bath. Curiously enough Bronnert in Patent 1,422,412 dated July 11, 1922 suggests utilizing a spinning bath containing condensation products of phenols or naphthols on one side and aldehydes and sulphites on the other for viscose threads.

Pyrotechnics and Flame Producing Materials

H. Plauson in his patent 1,500,844 dated July 8, 1924 goes so far as to suggest the use of a phenolic resin for pyrotechnics and flame producing materials. Phenol or one of its monohydroxy or polyhydroxy homologues is mixed with formaldehyde, paraformaldehyde or hexamethylene-tetramine and diazotized paranitroaniline added thereto. The product is orange or red and on cooling changes to a solid metallic green or orange azo resin soluble in oils or fats to give intense orange color. The preliminary condensation may be effected with the aid of an alkaline carbonite or alkaline sulphide. The phenol may, if desired, be sulphonated either initially or later. A bluish resin may be made by condensing furfural and phenol in the presence of anhydrous potash, neutralizing, dehydrating and coupling the product with diazotized paranitroaniline.

Shoe Laces

Eleazer Kempshall in Patent 1,073,496 dated September 16, 1913 and C. P. Berolzheimer in

(*Continued on page 699*)

Technical Abstract Section

A Concise Review of Patents and Literature

Condensation Product of Formaldehyde and Urea. U. S. P. 1,704,347; Mar. 5, 1929. Leonard Smidth, assignor to Edward G. Budd Manufacturing Company, of Philadelphia.

225 grams urea are dissolved in 640 cubic centimeters of 35% slightly acid formaldehyde (approximately PH+5.2). The solution is kept at 25° to 35° C. for approximately thirty minutes. Thereupon approximately thirty percent of the water present is removed by vacuum distillation. Then 63 grams of thiourea are added and the solution vacuum-distilled till as viscous as possible in an oil bath at 150° C. The solution is cast and permitted to cool. If the right conditions are obtained, the solution is clear on cooling. The clouded product is aged at 95° C. for three days and becomes clear.

Process of Making Resin-Impregnated Sheets. U. S. P. 1,703,414; Feb. 26, 1929. Gordon E. Wightman, assignor to Bakelite Corporation.

The process of preparing a substantially dry fibrous sheet impregnated with a reactive and plastic resin, which consists in suspending in water, a fiber and a reactive resin; laying the mixture into a sheet and draining excess water therefrom; and finally moving the partially dried sheet through a zone of reduced pressure while heating the same sufficiently to expel the bulk of the residual moisture without substantially reacting the resin or lessening its plasticity.

Method of Producing Phenolic Condensation Products. U. S. P. 1,710,722; Apr. 30, 1929. Oscar A. Cherry and Franz Kurath, assignors to Economy Fuse and Manufacturing Company, of Chicago.

A phenolic body is treated with formaldehyde or other methylene containing substance, the proportion of formaldehyde or other methylene containing substance being limited below the amount required for complete reaction, said treatment being carried on in the presence of furfuramide or a mixture of furfural and an ammonia producing substance, as for example hexamethylenetetramine or aqueous ammonia.

Phenolic Condensation Products. U. S. P. 1,707,941; Apr. 2, 1929. Julius A. Nieuwland, assignor to Canadian Electro Products Company, Limited, of Montreal, Canada.

3 parts of dry mercuric sulphate is treated with 28 parts concentrated sulphuric acid. This mixture is then added to 200 parts phenol. Dry acetylene is now passed into the mixture, maintaining the temperature at from 50° to 120° C. but preferably 90° C. to 110° C. The gas is absorbed rapidly, the period of reaction being only about 30 minutes for laboratory quantities. Approximately 36 parts of acetylene are absorbed and the material in the flash is a resinous body which on cooling becomes solid or semi-solid.

Urea Resins. U. S. P. 1,704,348; Mar. 5, 1929. Leonard Smidth, assignor to Edward G. Budd Manufacturing Company, of Philadelphia.

2250 grams urea are heated to boiling with 6400 cubic centimeters of 35% formaldehyde, PH 5.7, under a reflux condenser. After boiling for five minutes, 630 grams thiourea together with one cubic centimeter formic acid are added and heating continued for approximately two hours. It is then filtered and the water removed by vacuum distillation. When nearly all water possible has been removed, 100 cubic centimeters of 10% formic acid is added and distillation continued until as viscous as possible and yet capable of being poured and cast. The product is immediately poured into molds where it soon gelatinizes. The castings are then stripped from the molds and placed in an oven. Sufficient heat is applied to dry them out as rapidly as possible without cracking.

Electric and Thermal Insulator. U. S. P. 1,704,629; Mar. 5, 1929. Andre Albert Samuel of Paris, France.

Sulphur mono-chloride and pheolic condensation product selected, for instance, condensed phenol-formaldehyde, are mixed together. The reaction is very active and very exothermic and the temperature of the mass rises to such an extent that the latter tends to solidify rapidly before the end of the evolution of gas, which would result in a spongy material. To slow down and regulate the reaction the latter is effected in the midst of an inert medium with energetic cooling and the sulphur chloride is introduced drop by drop. The inert medium used must preferably have a high boiling point: one can use, for instance, petroleum jelly. In this manner one obtains a homogeneous material of the consistency of putty, which hardens after a few hours of heating in the steam oven. Before this heating in the steam oven, one can advantageously submit the material to pressure so as to increase its homogeneity in eliminating all traces of internal gas.

Plastic Composition Materials. U. S. P. 1,692,856; Nov. 27, 1928. Clarence A. Nash, assignor to the Cutler-Hammer Mfg. Co., of Milwaukee, Wisconsin.

50 pounds of asbestos is placed in a kneading machine or other suitable form mixer, together with 16.75 pounds of cresol in which 3.3 pounds of hexamethylenetetramine has been dissolved. Such ingredients are mixed with one another for from twenty to thirty minutes, or until a homgeneous mass is effected, whereof the asbestos filler is thoroughly impregnated with the cresol of the binder. Subsequently to such mixing operation the compound is placed in a drier and subjected to a moderate degree of heat for initiating chemical reaction between the cresol and hexamethylenetetramine, the mass undergoing reaction being stirred, rotated or otherwise agitated to prevent unequal or local heating, and the supply of heat being so controlled that the temperature of the mass does not materially exceed 175° F. The heating is continued until the desired incomplete stage of the reaction is reached, the supply of heat being then discontinued whereupon the reaction ceases.

Phenolic Resin Composition. U. S. P. 1,695,556; Dec. 18, 1928. Victor H. Turkington, assignor to Bakelite Corporation.

Dibutyl phthalate is used as a softener for phenol resins used as a varnish base.

Production of Condensation Products of Phenols with Aldehydes. U. S. P. 1,693,461; Nov. 27, 1928. Grigori Petroff, of Moscow, Russia.

100 parts of commercial 97% carbolic acid. 100 parts of 40% formaline. 2 parts of the sodium salt of toluene-sulphone-chloramide.

When heated with a reflux condenser, water separates out. Water is eliminated from the initial product of condensation by evaporation. A viscous varnish-like mass is obtained. Into this mass there is introduced at an ordinary temperature one per cent by weight of octo-hydro-anthracene-sulpho acid dissolved in 4 parts of a mixture of ethyl alcohol with glycerine (two parts of each.)

After the introduction of the acid catalyst the mass is left to stand, hardens and is thereupon fixed by heating. When a basic catalyst is introduced a similar procedure is adopted. A saturated ethyl alcohol solution (20-25%) of caustic soda is prepared, 20% glycerine added to the solution, a part of the alcohol distilled off and the solution of caustic soda obtained in this manner used as cata-

lyst. For industrial purposes the known preparation "Aktivin" (sodium salt of toluene-sulphone-chloramide) may be used as basic catalyst.

Resinoids from Alkylated Phenols and Ketones. French Patent No. 636,119; June 17, 1927. Chemische Fabrik Auf Actien.

Ketones and alkylated phenols are condensed in the presence of a condensing agent such as hydrochloric acid at temperatures below 100°.

Aminoplastic Containing Proteids and Cellulose. French Patent No. 636,-219; June 18, 1927. Schmidt.

Urea or its derivatives is condensed with formaldehyde and dehydrated in the presence of supports such as casein, cellulose, or its derivatives, mixed or not with softening agents, natural or artificial resins, or polymerized vinyl ethers, to obtain a spongy porous product.

Preparation of Cellulose Esters. British Patent No. 289.973; Feb. 8, 1927. I. G. Farbenindustrie, A.-G.

Acetylation of cellulose or of its conversion products is effected by use of an acid anhydride such as acetic anhydride together with a halogenide of sulfurous acid such as thionyl chloride and a heavy metal salt such as zinc chloride or copper chloride suitably in the presence also of a diluent. The product obtained, such as cellulose acetate, may by addition of water be converted into products soluble in acetone or in ethyl acetate.

Cellulose Ester Solvents. Canadian Patent No. 285,149; Nov. 27, 1928. Guy H. Buchanan.

Solvents for nitrocellulose consist of the esters of hydroxyisobuytric and similar acids. These esters may be prepared from acetone cyanohydrin and other cyanohydrins by treatment with hydrochloric acid and the desired alcohol.

Cellulose Esters in Shoes; use of Diacetone Alcohol as a Solvent. Stanley P. Lovell, assignor to the Celastic Corp., of Wilmington, Del. U. S. P. 1,711,956; May 7, 1929.

4. The method of treating a shoe stiffener containing celluloid, said method comprising softening the stiffener by wetting it with a mixture of diacetone alcohol and ethyl alcohol, and then causing the liquids to evaporate by exposue to air whereby the celluloid will take on a strong, impervious, elastic form regardless of moisture in the air.

Nitrocellulose Composition. U. S. P. 1,703,415; Feb. 26, 1929. Hamilton Bradshaw, Edgar H. Nollau and Richard G. Woodbridge, assignors to E. I. du Pont de Nemours & Co.

1. A coating composition consisting essentially of precolloided and seasoned pyro nitrocellulose and a softener therefor.

2. A coating composition consisting essentially of precolloided and seasoned pyro nitrocellulose and a softener therefor comprising a non-drying vegetable oil.

6. The process of making a coating composition which comprises dissolving in a nitrocellulose solvent a nitro-

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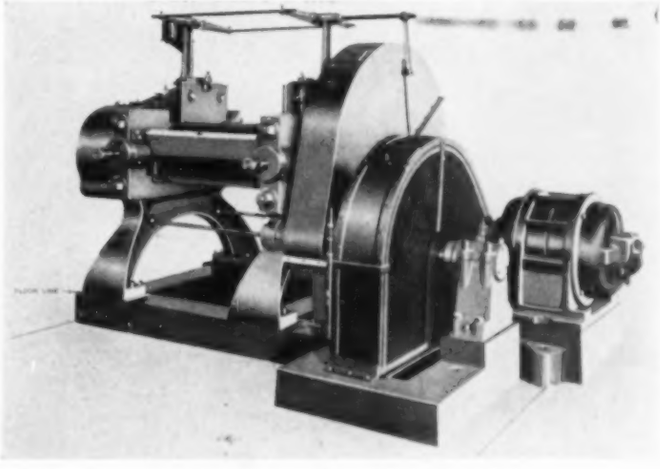

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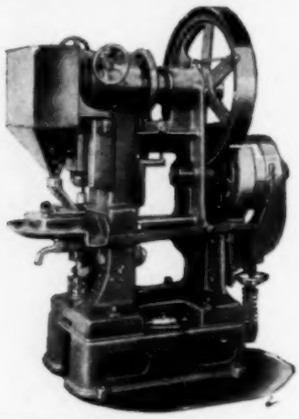

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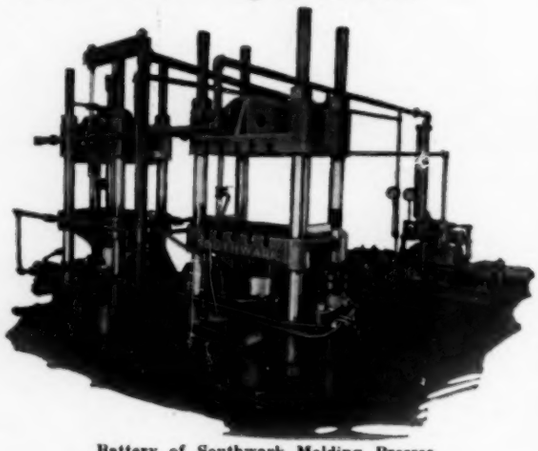

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cellulose mass obtainable by colloiding a nitrocellulose of more than 12.4 nitrogen content, comminuting the resulting colloid, seasoning the comminuted mass for from about 2 to 4 weeks at a temperature of about 60° C., further seasoning the mass at about atmospheric temperature until a standard testing solution made therefrom shows a viscosity of less than 200 seconds when measured by the method hereinbefore described.

Cork as a Plastic

(*Continued from page 679*)

ets. The plunger shown in the center of the figure is packing the cork, which however is not pushed into the tubes 106 since there are slides 125 each with an orifice 126 having the same shape as the bore of the tubes and which are so placed as to prevent a thru passage from the drum 107 into the first heating jacket 108 until the slug of packed cork and binder reaches the point shown at the left of the figure at which time the cam 130 has engaged the slide 125 and pushed it in so as to have alined the hole 126 with the proper tube 106. The cam 130 like the cam 102 is stationary and the former carries a small lip 131 so that after discharge of the so-formed slug of cork from the drum 107 to the tube 106, the slide is withdrawn radially outward by engagement of a downturned lip 133, such engagement pulling the slide to the position shown at the right of the figure, that is, in the outermost position where it serves as a stop for the pockets of the drum.

The cold jackets 107 and 109, since they rotate together, may be permanently secured for the circulation of the cooling fluid as for example, by the pipe 136. Water is fed through the pipe 137 to an annular trough 138, the water circulating through the entire jacket and discharging through the pipe 136 to the jacket 109 from whence the warmed water is discharged through the pipe 140 to a sta-

tionary, annular trough 142 is carried by the base, such trough having its outlet through the pipe 143 in the base.

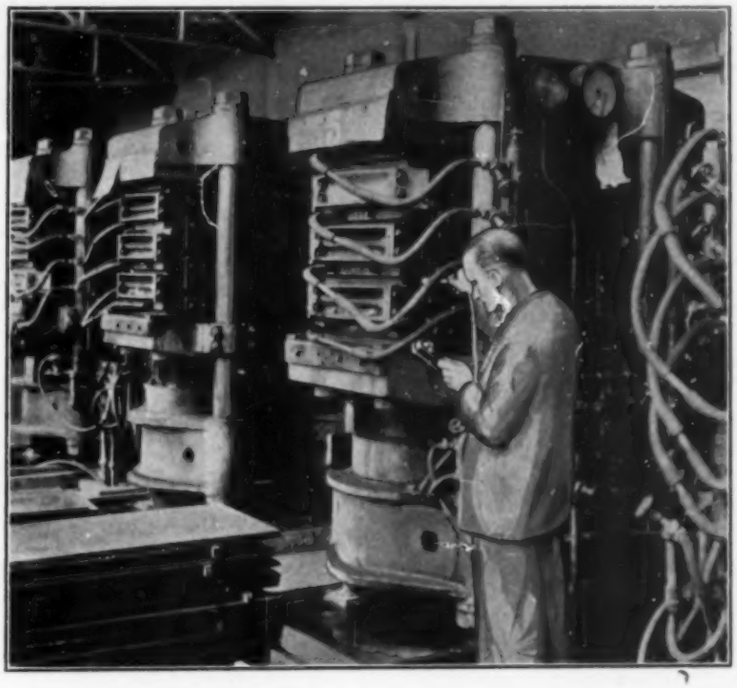
The operation is as follows:—

The comminuted cork particles with the binder is fed into the hopper 120. The plunger 118 shown at the right pushes a quantity of this cork down into a pocket of the drum 107, the pockets each being of a cross section exactly the same as the bore of the tube 106 and obviously axially alined therewith. At such time the slide 125 forms a bottom for the pocket as the hole 126 in the slide is at this time to the right of the pocket in the drum 107.

The plunger 118 descends continuously, packing the cork quite tightly and finally discharging it upon pushing in of the slide 125 by the cam 130 to bring the orifice 126 in registry with the pocket and tube. The last few slugs discharged into the tube are still soft since the heated jacket 108 surrounding the entrance end of the tube has not yet had time to act so that the slugs unite forming a continuous rod as in the previously described machine.

Constant Upward Pressure On Spring

The plungers rise as they pass through the 180° hidden in the figure so that the plunger shown at the right is at the highest position, and ready to feed a quantity of loose cork into the preliminary receiving drum 107. In order to prevent axial expansion of the rod of cork I prefer to have a lever 150 pivoted as at 151 serving exactly the same purpose as the lever 55 in the form shown in Figure 1. The end 153 of the lever passes into an orifice 154 and adds materially to the friction on the formed rod and retards or entirely stops as desired its progress downward. A spring 155 constantly urges the upper end of the lever outward, such end pivotally carrying a roller 157 which engages the cam bracket 158, there being a lever 150 for each of the tubes, so that the time each successive



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slug is fed into the tube the pressure of the lever is withdrawn by engagement of the cam 158 and roller 157. During all the remainder of the revolution, the spring closes the lever on the molded cork rod.

In many cases to obtain a greater density in packing and a more perfect joint between particles in large size bars I have found it good practice to have lever 55 or 150, as the case may be, acting to retard or stop the travel of the cork at the time the drum is stopped and while cork is being pushed in, and in such cases the lever moves to release position at time of each intermittent movement of the drum.

Jackets Oil Heated

The hot jackets 108 and 110 are filled with oil or other fluid in any way desired, as for example, thru the pipes 160, and are heated by a series of gas burners or other heating devices 162. Obviously live steam may be used as the heating medium in place of the oil.

The specific form shown in this figure is preferred for many purposes, lending itself particularly convenient to the making of caster rollers. In case there is to be a core for the cork, whether a solid rod or a tube, the plungers 118 are made hollow as shown in Figure 4, the central hole 170 being of size to slip freely over the cores 171 which are fed downwardly by gravity until they meet the cork and from then on they are fed downwardly by the adherence of the cork to them. The cork grips the core lightly in the drum 107 holding it only by the friction of the compression of the cork against the core, but there is nothing to hold the cores back in their downward movement, on the contrary both gravity and the firm adherence between the cork particles and the core or cores at the bottom of the heating zones insures this movement together of the cork and cores. The cores are of different shapes and sizes, for example, leads for pencils, bushings for wheels, spring barrels

for shade rollers and so forth and are not necessarily circular in cross section neither is it necessary that the tubes themselves be circular in cross section. When using a core the slide 125 is made in two pieces, each cam operated so as to permit passage at all times of the core rod while permitting the packing of the slug about the rod in the preliminary drum.

Slow evaporation of any moisture or liquid solvent tends to cause shrinking after the cork is molded and this naturally helps to cause greater gripping on metal center. Where it is desirable to form a central opening without any metal lining, the rods or cores 171 are held rigidly as for example by securing same to the large sleeves 117, the plungers 118 with their central holes 170 being slotted for this purpose in such case. The rods or cores may be heated and cooled in portions as desired.

Sawdust, Leather Usable

In describing my process I have referred to the particles as being of comminuted cork but other material besides cork can be used, such for example as saw dust, leather shavings, mixtures of asbestos and cork, etc. In making cork bars that are to be cut into disks, etc. I enlarge the passageway before coming to the exit end and by means of the heat in the core, the heat from the last heating zone or both I expand the cork bar to proper size and density."

Two closely related patents were granted on July 30, 1929, to Enrique Vincke, of Barcelona; U. S. P. 1,722,611 and 1,722,648. They relate the preparation of thin molded cork sheets of great flexibility. These are produced by cutting thin small flakes of cork and comprising the same while heating to about 575° F. At this temperature the natural resin in the cork partially volatilizes and migrates to the surface of the cork, serving thus as a cement to hold the particles together. Provisions are made to allow of the free escape of gases formed. The product is preferably cov-

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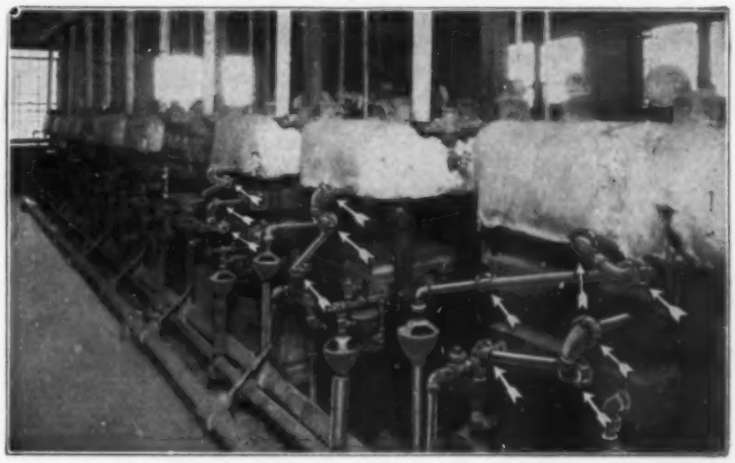

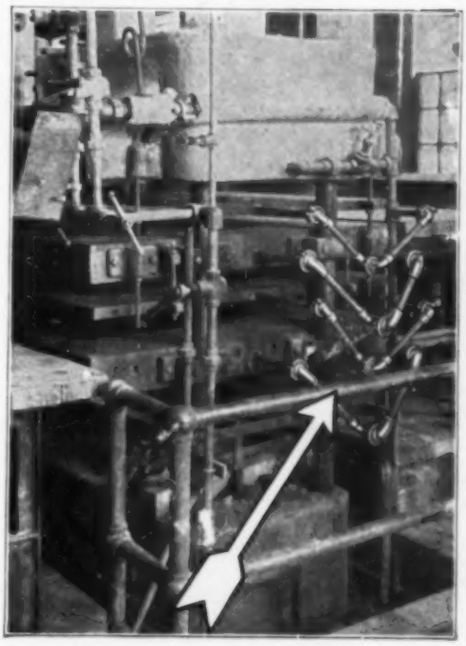

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ered under pressure, and forms strong, coherent, flexible sheets suitable for gaskets, heat insulation and for floor coverings. The patents are controlled by the Spanish firm known as Manufacturas de Corcho S. A.

Molded Cork Wringers

William F. Grupe, of Lyndhurst, N. J., describes a method of molding hollow wringer rolls from cork particles. As described in his U. S. P. 1,718,647; June 25, 1929 (assigned to Boucher Cork Co., of New York), an annular mold is partially filled with cork powder, which is then compressed by a sliding annular compression member actuated by an hydraulic plunger.

Successive fresh charges of cork are fed into the annular mold and compressed therein until the latter is full with the compressed material.

The mold is then heated, preferably electrically, from its hollow interior, so as to bake the compressed cork to a temperature of from 185° C. to 275° C. This volatilizes the resin in the cork and causes it to act as a binder for the cork particles. As the outer side of the mold is not heated, more of the resin will congregate there, thus providing the cork roller with a more water-resistant face.

The finished rollers, after removal from the molds, are mounted over iron spindles to which they are secured. The patent claims cover only the above described method of forming the rollers.

Cashew Nut Plastics

(*Continued from page 681*)

plied to fabrics or mixed with fillers and when desired further condensed to a desired state of hardness. Heretofore phenol, ortho and meta cresol, resorcinol, and carvacrol among others have been used to produce phenolic condensation products but these have only one active group in their molecules and the resins made from them are either semi-solid or highly viscous and require high temperatures to render them plastic and to cure them.

Technical Abstracts

Fatty Acid Esters of Cellulose of High Viscosity. U. S. P. 1,708,787; Apr. 9, 1929. Henry Dreyfus, of London, England.

Example 1.

100 parts by weight of cellulose for example cotton, are introduced into a mixture of 800 parts by weight of glacial acetic acid, 15%-20% of sulphuric acid relatively to the weight of the cellulose, and about 200 to 250 parts by weight of acetic anhydride, this mixture having been first cooled down to 0° C.; the temperature is allowed to rise gradually, cooling being continued until complete solution. The reaction is complete in about 2 to 6 hours. If desired, the temperature towards the end of the reaction may be allowed to rise to 25° or 30° C. or even somewhat more to finish the reaction. The cellulose acetate obtained is of much higher viscosity than any hitherto known, as is proved by the fact that the acetylation solution obtained is, in spite of the 70% greater dilution, just as viscous as the best acetylation solutions previously obtainable, for example those obtained according to my said patents previously referred to. The product can be isolated and employed as such or be submitted to a secondary or further treatment either in the original acetylation solution or after isolation therefrom. The isolation of the product from the acetylation solution may be effected by precipitating it in water or with water or with diluents such as carbon tetrachloride and so forth.

Method of Insulating Conductors. U. S. P. 1,689,312; Oct. 30, 1928. Robert R. Williams, assignor to Western Electric Company.

To provide an insulated conductor having the desired characteristics, the invention contemplates the use of an insulating compound which is first vulcanized then rendered plastic and extruded in a continuous sheath about the conductor by means of heat and pressure.

Complex Cellulose Esters. British Patent No. 290,570; May 14, 1927. H. T. Clarke and C. J. Malm.

The process described in British Patent No. 289,853 is modified in order to produce cellulose esters containing both nitrate groups and halogen substituted acyl groups; for example, a nitrocellulose (suitably containing about 11% nitrogen) is first treated with an esterifying agent containing an acyl group having an ethylenic linking and the unsaturated ester thus obtained is then treated with a halogenating agent such as bromine or chlorine. Esterifying baths containing an anhydride such as monochloroacetic anhydride as described in British Patent No. 287,880 are preferable, and among the esterifying agents which may be used are crotonic acid, undecylenic acid and other acids of the same series and substituted acids such as cinnamic acid. An example is given of the preparation of and subsequent halogenation of *cellulose nitrocrotonate* to obtain a product suitable for making transparent films. British Patent No. 290,571 specifies a modification of the process described in British Patent No. 287,880 for producing cellulose esters containing both aryl radicals having less than 10 carbon atoms and also aryl radicals with more than 10 carbon atoms, in order to produce esters containing a higher proportion of higher acyl radicals, by use of an esterifying bath prepared by mixing the fatty acid anhydride corresponding with the lower acyl radicals with the acid corresponding with the higher acyl radicals and then removing, at least in part, the lower aliphatic acid formed in the bath and if necessary adding a non-esterifying solvent.

Aliphatic Dinitro Compounds as Cellulose Ester Solvents. U. S. P. 1,694,097; Dec. 4, 1928. Marion B. Hopkins and Hvym E. Buc, assignors to Standard Oil Development Co.

100 grams cellulose nitrate are dissolved in a mixture of 150 cubic centimeters of mononitro compounds and 400 cubic centimeters of ethyl alcohol (95%). A clear solution results, to which up to 300 cubic centimeters of benzol may be added without precipitation of the cellulose nitrate. Any less proportion of benzol may, of course, be employed if desired.

In the above example, absolute ethyl alcohol or other alcohols, for example, those above mentioned, may be substituted for the 95% ethyl alcohol. The same is true in the formulas hereinafter set forth in which the use of 95% alcohol is described. In the above example, the mono-nitro compounds employed are the steam volatile products of nitration, consisting largely of mono-nitro compounds. The mono-nitro compounds employed successfully in the above formula have been those derived from various cuts from gasoline, for example, the cut between 150 and 175° C., and likewise those derived from separated hydrocarbons, such as octane, nonane, etc.

"Further, by the use of this oil molded articles of the solid resin or a mixture thereof with a suitable filler such as a slate dust can be made without the use of the excessive temperatures and pressures which are necessary for the production of resins from phenol and the like because the resins heretofore made have such high viscosities or are solids which are with difficulty rendered plastic.

"Further, resin-impregnated fabrics for insulation or other uses can be made much cheaper because the fabric can be immersed in the liquid and partly condensed resin and the impregnated fabric then removed and cured to secure the condensation of the resin to the desired degree. Again, flexible fabrics impregnated with resins of this nature such as were not heretofore procurable can be made by curing fabric impregnated with the liquid resin of my invention to the desired degree of hardness and flexibility of the combined fabric and resin.

"The high cost of phenol and other manufactured products heretofore used for making synthetic resins has limited the extent to which these resins have been used. But on account of the great quantities in which the cashew oil occurs in nature and the comparatively very low cost thereof resins can now be made and used for a great number of uses where they will replace less suitable or more costly material."

Unusual Applications of Resinoids

(*Continued from page 691*)

Patents 1,465,754 and 1,499,286 dated August 21, 1923 and June 24, 1924 have suggested making shoe laces tips from an artificial plastic. Kempshall compresses and holds the end of the shoe laces in shape by means of a temporary binder such as permeable gummed cloth or glue and then applies a coating of Bakelite to form a tip therefor. Berolzheimer applies a condensation product of a phenol or casein and formaldehyde or hexamethylenetetramine in powdered form to a braid, lace, rope or twine by a specially constructed set of dies which apply the requisite heat and pressure simultaneously. In the last mentioned patent Berolzheimer winds the shoe lace material regularly upon a rack and the lower or female die is then applied to the material on the rack, one strand of the material being fitted into a corresponding notch in the die, the notches being formed by spaced plates.

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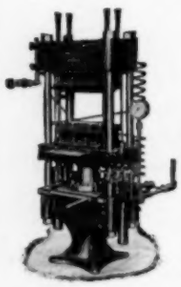

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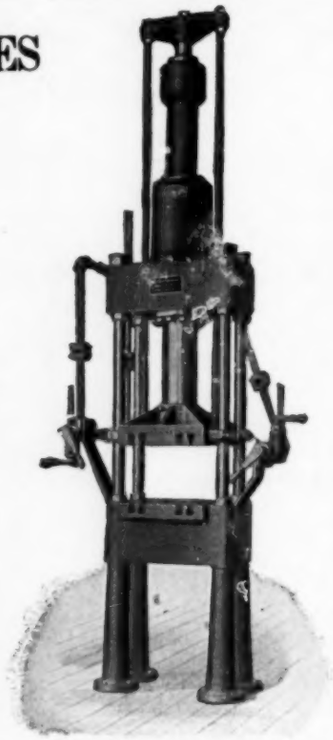

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The condensation product is applied in a semi-final, powdered, liquid or semi-liquid form and then the upper or male die is fitted into position. The apparatus is placed into a press and heated. A completed tip of double length is formed in each section of the die, and it is necessary to separate the tip material at the middle line of the die.

Preserving Media

J. Brunner in Patent 1,588,-164 dated June 8, 1926 utilizes a condensation product from phenol and phenol derivatives on the one hand and aldehydes such as formaldehyde on the other hand; from methyl chloride and phenol; from sulphur and phenol, from aromatic amines and sulphur; from urea and its derivatives and aldehydes such as formaldehyde; from furfural and acetone and aldehydes and aromatic amines to preserve insects, plants, amphibia, reptiles, fish, crustacea and other physiological specimens. The article to be preserved is simply embedded in the condensation product which is then hardened in any suitable manner.

Stencil Sheet

A. B. Dick in Patent 1,694,-058 dated November 15, 1927 uses a synthetic resin as a coating for a stencil sheet made of open mesh Yoshino paper. Among the resins mentioned are the phenol aldehyde, and the amino-aldehyde condensation products as well as the phthalic anhydride-glycerine resins (glyptal). Tempering or distending agents such as oils, fats and waxes particularly castor oil; softening or lubricating agents such as Japan wax and paraldehyde; a plasticizer preferably a halogenated hydrocarbon such as chlorinated naphthalene with or without an additional modifying agent such as nitrocellulose or other cellulose derivative may be incorporated into the plastic, which may be applied to the base sheet either in a melted condition or in acetone solution.

Sticky Fly Paper

Carleton Ellis in Patent 1,663,160 dated March 20, 1928 suggests using an artificial plastic as the sticky coating on fly paper. The plastic is made by reacting on a phenol such as carbolic acid, cresol, (ortho, meta or para), xylene or naphthol with sulphur monochloride. This application is certainly far removed from such applications as have already been discussed. But an application even further removed is given by Harry M. Weber and Carleton Ellis in Patents 1,248,961; 1,402,817 and 1,570,584 dated December 4, 1917, January 10, 1922 and January 19, 1926 respectively. Cumaron resin, an artificial plastic derived by the polymerization of such bodies as cumaron and indene found in heavy coal tar naphthas is made suitable for use as a chewing gum by incorporation of sugar, chicle, paraffin wax, glycerine, hydrocarbon oil such as Russian petroleum oil and the usual flavoring ingredients such as peppermint, wintergreen or spearmint. Ethyl stearate may also be added as an additional softening agent.

Numerous Other Applications To Be Discussed Later

Other possible applications of the artificial plastics suggested in the Patent Literature include such a wide diversity as substitutes and imitations for ivory, rubber, amber, meerschaum, leather, oil cloth, linoleum, hair, mother of pearl and glass; stained and frosted glass effects, lead pencils, sand paper, shoe polish, indelible ink, notary seals, artificial limbs, human features, false teeth and filling compositions for teeth, rust preventatives, polishing materials, cleansing material, phonograph records, phonograph needles, labels for sound records and game devices such as dice, golf clubs, billiard cues and tennis rackets. To discuss them all would require more space than can possibly be given within the limits of an article such as this. Some of them will be taken up in later papers.

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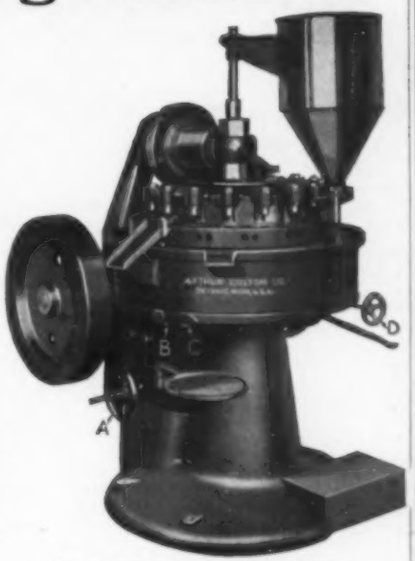

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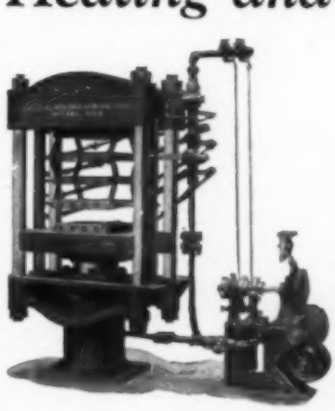

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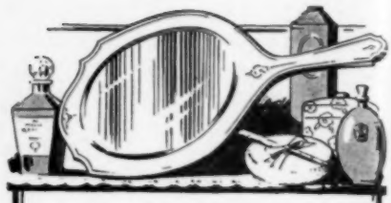

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Vol. 3 **DECEMBER, 1929** **No. 12**

A Round Robin Discussion on the Molders' Generic Name

Six Industrial Leaders Offer Varied Comment on the Association's Choice of "Synthoid."

Receipt of the letter from Dr. Baekeland, published as part of this article, suggested the thought that other leading figures in the plastic industries might also contribute their reactions to the present choice of name. PLASTICS AND MOLDED PRODUCTS is pleased to present these letters to its readers.

PLASTICS AND MOLDED PRODUCTS maintains that the Molder's Association is amply justified in seeking an all-inclusive name or slogan for encouraging the wider use of their output, namely—Molded Articles. The manufacturers of moldable materials would certainly welcome such a movement. Let the shining example they look to be "Save the Surface and You Save All" rather than "Kodak."

The Editor.

Bakelite Corporation

247 Park Ave., New York

To The Editor of "Plastics"—

I am informed that a special committee has been invited to submit to the National Electrical Manufacturers' Association a suitable word, not a trademark, which can be adopted as a general name for all synthetic resins. I am told further that at a recent meeting the word "Synthoid" has been proposed to that effect.

As a man who has spent many years of his life in this field, I think it my duty to state that I believe the selection of the word "Synthoid" rather inappropriate:

1. "Synthoid" has no meaning. It barely suggests that the material is made by synthesis. The termination "—oid", a suffix of Greek origin, has been used repeatedly in chemistry and other sciences, meaning "like", "resembling to", as for instance in metalloids, asteroids, anthropoids. On this account the suffix -oid looks rather incongruous in conjunction with "synth-" and would suggest a material which resembles a synthesis. The combination is obviously absurd. We might more suitably leave this word to bootleggers to designate their products.

2. It is preferable to use a word of which the pronunciation in various languages differs as little as possible, which is not the case with "synthoid" not even in "American". "Synthoid", can be pronounced as "Saintoid", "Sintoid", "Sintod", "Sanetoid", "Sentoid", etc. In the East Side dialect where "toitytoid" means thirty-third, they may even come to write it "Saint-third".

The Rayon manufacturers in selecting a name for artificial silk committed a similar mistake when adopting a French word of difficult spelling and pronunciation, and by absolutely perverting its accepted meanings. I quote from the dictionary to show that "rayon" has many meanings, but none which has any relation whatsoever to artificial silk.

On the other hand, there exists already a suitable word, the use of which is available to the trade, which has been used in chemical literature and even in newspapers and magazines, namely, the word "Resinoid", which has a phonetic spelling and and is easy to remember. "Resin-" indicates its relation to resinous material while the termination "-oid" indicates that it "looks like" resin without being a natural resin. Just as the metalloids, Antimony or Arsenic, look like metals and have some of the properties of metals without being metals.

Celluloid was an excellent word, because this material was made from cellulose, and was a variety of cellulose without being cellulose.

As to "Resinoid", it permits, in combination with other words, a close definition of what variety of resinoid one refers to. This is very important, as there exist today phenol-resinoids, cresol-resinoids, acrolein-resinoids, phenol-formaldehyde - resinoids, and phenol-furfural-resinoids, not to overlook urea-resinoids, sulfourea-resinoids, or amino-resinoids, etc.

Very truly yours,

L. H. Baekeland.

Synthetic Plastics Co., Inc.
535 5th Ave., New York

To The Editor:—

I know from past experience in advertising work that every trademark is an acquired taste, until it is actually adopted and put into use, whereupon nobody examines the sound and the implication of the word any more, and uses the word without thinking about it, and everybody is satisfied from that point on.

The thing to do is to decide on something, close the discussion, and after that there is unlikely to be further trouble.

I suppose I could pick on the word "Synthoid" and any other word that could possibly be concocted, but it is a good mouthful and I see no reason why the trade should not adopt it.

Very truly yours,
Richard S. Childs,
President.

Editor's Note:—The following was received over the signature of Mr. B. F. Conner, Colt's Patent Fire Arms Mfg. Co., and contains broad comment on several problems confronting the molding industry as well as the one under discussion at the moment.

"SYNTHOID"

(with apologies to the Tongue Tied)

"The Tent Builders of Old; Today's Weavers of the Wet Blanket."

"Shall We Generalize or Specialize"

WHY do so many of our friends in the Plastics Art toil so arduously to build up an Association that they are so thoroughly convinced is essential for the welfare and progress of the Moulding Industry, only to arrive at the conclusion that retrogressive policies are more constructive than progressive activities?

Why the Reverse gear?—to go forward. Now is the time to slip into "Mutual" (as says Chic Sale.) Let us spend some serious moments in straight ahead deliberation. (Better still, let's all hie to Hoboken with Sandy and have it out as in the good, old days).

"Synthoid!" Have we not in "Synthoid" a child of superficial thought and effort; a future incorrigible; bound far beyond our control. Will not "Synthoid" cause more doubt, more fear and suspicion within the minds of the Buyers than already exists? Is this a constructive answer to specifications that are growing more important and more essential with today's expansion in the applications of the Moulding Art?

Are not the large material manufacturers continually adding grades and more grades to their lists, and now developing others in order that we may all meet new conditions and new developments with specific materials in accordance with specifications of the new demands?

Have we not in this attempt to generalize offended this great age of specifics? Do we not find in this very committee's consensus of opinion, our answer to the basics of our industry's worries—obsolescent thought, plan and action; superficial effort and no analytical reasoning?

Is it not too many plants, builded upon this very foundation, endeavoring to serve buyers with something that they do not thoroughly understand; something for which they are not properly organized, equipped or financed to make?

Analyze, if you will, some financial statements and organizations; view their equipment, examine the molds they cause to have built, observe the sales approach and listen to the answers given to the Buyer's questions by their representatives. Then read the advertising of these concerns. Daily are these indisputable evidences of the superficial, insincere and misleading, functioning as silent salesmen in behalf of the recognized.

"Synthoid!" The generic term as intended—like a tent over a side show—housing, covering, if you will, a conglomeration, for such is what you would have. Non-comparables in one classification—one more sceptic producer; further cause for additional caution and added suspicion on the part of your Buyers.

No! This industry is not so constituted that a generic term with such scope as is now intended will properly and therefore constructively apply. Any general designation would function as unionism; quality mothering inferiority; known, the unknown; and capable, the inefficient.

We all acknowledge the specific "Bakelite" as the Trail Blazer of the industry—an outstanding success and universally known. It has cost millions to make it so. The position of the industry today is deeply indebted to it. There is more value to this specific name "Bakelite" than to the physical holdings of the corporation.

"Durez"—separate this specific name from the General Plastics Co.,—then ask your bankers where the value lies—in the name Durez, or in the plant manufacturing it?

"Coltrock"—a list of its customers reads as just another volume of "Who's Who in Industry," and so it goes. "Specifics" valued for what they are; how thoroughly well they are known and desired. Good-will, the mighty intangible; the fundamental reason for the great advertising industry existent today.

Submerge these specifics, "these bywords of our industry", and you help open the door for the substitute, the "just as good"—those that would traffic on the good-will of others. Surely, we should encourage all the new materials, new formulas, new methods, etc., but they should carry specific designation and stand or fall upon their individual merit.

Why spread the wet blanket over the few outstanding specifics of our industry? Why not now shift from "Mutual" to High? High, in this industry, is a definite place open to those who would acquire the full measure of proper knowledge of today's progressive practice, and

build for that which the future holds in abundance.

This industry needs fewer words—less talk and more work. It needs not one organization, but many reorganizations. It needs not general advice, but specific knowledge. It needs not a shrine to which the many may visit in the hopes of casting aside their crutch. It needs specific treatment as may be required by the individual person or organization.

Inventory time is at hand. It is to be regretted that compulsion only applies to our physical plant assets. This year, if ever, we owe it to ourselves to take an unbiased inventory of our policies, our plans and our personnel, and then be generous with the debits. Then, and only then, can you expect to play the successful part and reap the desired reward.

A few specific rules religiously followed will do more for this industry and for ourselves than all that may be hoped for otherwise:

1. We shall "know" our work thoroughly.
2. We shall only be represented by those that equally well "know."
3. We shall represent and present only that which we so thoroughly know.
4. We shall always originate.
5. We shall never imitate.
6. We shall treat our competitors as such, and not as our selves, for we shall know.
7. We shall treat our customers not as our salesmen, for we shall know.
8. We shall not promise Heaven, for we shall reap Hell.
9. While we mould parts we shall mould reputation.
10. We shall so operate that we will not fear to turn our other cheek or even our back while stooping over.

Should our esteemed committee have had in mind an Ark and not a Tent, or Wet Blanket,

(*Continued on page 714*)

A NEW USE FOR PYROXYLIN SHEETING IN THE FINE ARTS

THE industrial user of pyroxylin plastic materials may feel slightly gratified to learn that the substance he uses in daily production does find application in a more artistic direction. Pyroxylin sheeting was used in the execution of the illustrations reproduced on this page.

Mr. Boris Artzybasheff, known as an illustrator of marked individuality and having a balanced sense of design, coupled his artistically creative ability with a recognition of the need of constant search for, and experimentation with, new media with which to accomplish effects novel and modern. In this instance, he was striving for a radical refinement of wood cut effects for book illustration and the examples shown here indicate the sharp and intricate detail he succeeded in attaining.

The two illustrations are taken from "Three and the Moon", a children's book by Jaques Dorey, published by Alfred A. Knopf. During the week of November 18th, Children's

Book Week, many of Mr. Artzybasheff's original engravings—a term for this type of work on pyroxylin sheeting has not been proposed as yet—and including the two shown here, were exhibited at Lord and Taylor's and in the Children's Room of the New York Public Library. These originals, which drew much attention while on exhibition, vary in size from about four inches square up to larger sizes about ten by eighteen inches. All these, although

meant for reproduction, were executed full size or larger, because Mr. Artzybasheff has sold many of his originals after they have been exhibited.

A word on wood-cut procedure in book illustration may cast some light on Mr. Artzybasheff's quest for another medium. The artist must engrave his design on a block of wood in reverse. The fineness of his work is defined by the grain and texture of the wood surface, never perfectly uniform. In a sheet of pyroxylin material, he encounters a surface continuous and homogeneous in every direction. For purposes of actual printing, a proof must be struck off the wood cut. From this proof a zinc or copper plate is made with which the book is actually printed. The zinc or copper plate is made directly from the pyroxylin engraving, however, and the intermediate step is eliminated.

Although this method of illustration may not produce any ponderable industrial reverberations, it is noteworthy as still another case in which a natural substance is substituted by a synthetic plastic material.

The New Urea-Formaldehyde Molding Powders

A general study of the various types of materials produced and some of their applications

By C. E. Slaughter

A molding composition with many of the properties of the well-established phenol resins, and with the added advantages of Pure Whites, light and bright colors, has long been the dream of the Molding industry. To this, add the fact that the finished article may be made up in a solid or translucent finish, and the matter becomes of immediate interest to every user and potential user of molded products. A short outline of the Urea-Formaldehyde Resins, with their advantages and disadvantages will, therefore, not be amiss.

History

As far back as 1899 scientists knew that a mixture of Urea and Formaldehyde produced something that was new, but it was not until 1918 that the first steps in producing the forerunner of the molding powder, was actually produced and patented. The announcement of this new glass-like material caused enormous interest, and in a short time a number of chemists in various countries were independently working toward the same goal. Austria was the first country to place this new molding powder on the market on a commercial scale, but some three years ago a well-known British firm announced a somewhat similar product. At the beginning of this year, a company in Brooklyn, New York, announced a third powder, and they were followed by the announcement by a well known chemical concern in New York, that they were producing the British material under license.

Today, near the close of 1929, there are three different concerns, one of American inception and the other two being related to the foreign sources mentioned, interested in this field, and each one makes certain claims for its particular product.

A Jade Green and White mottled molded toilet seat, made possible with the development of urea-formaldehyde molding powders, is in harmony with the new pastel shades in which bathroom fixtures are being executed.

Courtesy Aldur Corp.

Raw Materials

The raw materials used in the composition of these molding powders are supplied by Nature in unlimited quantities. Urea is made from atmospheric Nitrogen, and its widest use is for fertilizing nitrogen-poor soil on the farm. In this connection, it is interesting to note that the latest tariff reforms, calling for farm relief, places Urea on the free list of imports.

Formaldehyde is already well known as a preservative, and as an essential base for the phenol resins. A number of concerns in this country are manufacturing this product from wood-alcohol as well as synthetically from hydrogen and carbon mono and di-oxide. Thio-Urea, which is used by certain manufacturers, is made from a waste product of the gas industry, and is also available in any amount.

Molding

Urea-Formaldehyde powders are molded in practically all respects, in the same way as the Phenols. The essential differences are (1) a lower temperature, (2) the necessity of "gassing" the die. Instead of the usual 150 to 180 lbs. of steam, 100 or lower, according to manufacturers specification, must be used. Higher temperature will burn the material, and render it brittle. If "gassing" or "breathing" the die is not carried out, blisters or cloudy effects, which are actually produced by minute blisters will certainly result.

The chief difficulty that is met with in the average molding plant today is the ever-present bugbear Dust. With the opaque Phenols, especially in the

black and darker shades, a few spots of dark colored material are well hidden, but in the pastel shades, and especially where translucent effects are being worked, two or three minute specks of dust will mar the whole piece. This difficulty, however, will be overcome just as soon as the demand for urea-formaldehyde molded articles is sufficient to justify special departments, in the larger plants.

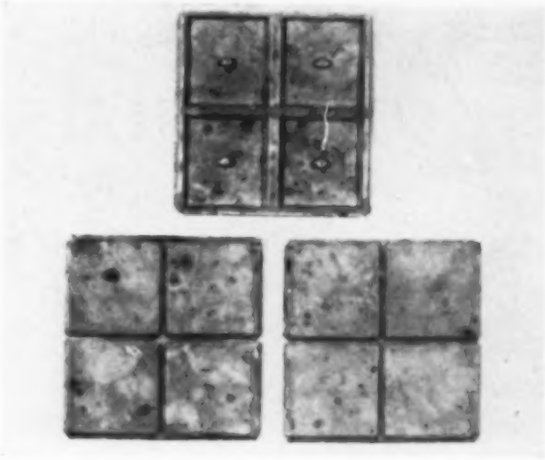
As those who have tested the present materials know, all the urea-formaldehyde powders are supplied in fine powder form, from 40 to 100 mesh. In this fine state it is not possible to produce the popular mottles obtainable with the coarser phenol powders, but instead, delicate flow and cloudings may be obtained, either by the use of preforms or by using layers of different shades of color in the die.

Powders Capable of Artistic Effects

Color effects are the "raison d'etre" of Urea-Formaldehyde powders. It is a simple matter to produce, say a solid primrose or light orchid molding, but a certain amount of skill is necessary to produce artistic results with these or any other two or three color combinations. A common mistake made by some molders is to mix up two or three colors before putting them in the die, and then hoping to obtain mottles or streaky effects. This procedure, however, is no better than mixing two different colored paints, and hoping to produce a spotty effect. In both cases, the result is a mess.

Preforming of urea-formaldehyde powders can be carried out in any standard pilling machine at the same speeds and pressures as used on the phenols. However, it is necessary to increase the depth of the cavity to allow approximately 33% more volume of powder to be compressed.

Molding pressures are about the same as for the phenols. Approximately 2000 lbs. per square inch is sufficient for simple moldings, although as high as 4000 lbs. may be necessary with some grades, on special dies.



Interlocking molded tiles are colorful and strong and find many decorative uses.

Courtesy Aldur Corp.

These, then, are the three main constituents, but fillers, coloring matters, and small quantities of essential chemicals are used, the compositions of which are known only to the firms in the manufacturing industry.

Properties

The pure Urea-Formaldehyde condensation product, which is the base of all the moulding powders, is, in its first state, a liquid. This liquid may be cast into sheets resembling glass, and in this glass-like state, it is being imported from abroad, and used in the production of novelties. This clear glass-like material has the unusual property of transmitting Ultra-Violet light up to a maximum of 90%, with the added advantage that there is no reduction in the efficiency due to ageing.

In the manufacture of Molding powder, this resin, with necessary changes in the chemical composition, is mixed with filler, colored as necessary, and ground to powder, ready for the molder. Since the resin is colorless, and the filler is practically pure white, the natural color of the finished powder is white also. It is for this reason, moreover, that it is possible to produce practically any color or shade from white to black.

In addition to the fact that the natural state is white, it has the added advantage of being translucent, with the correct fillers. However, there is so large a demand for pastel shades in the opaque materials that as much opaque as translucent material is now being produced. It is interesting to hear that some of these pastel shades of color are now being molded with complete success, with the darker Phenols. The pure "Snow White" is particularly valuable for the phenol molders for producing unusual effects.

The chemical changes that take place during the molding operation are most complex, sufficient to say that under the action of heat and pressure, the powder is welded together, a chemical change takes place. The resulting mass has good strength (approximately 25% more than the phenol article of equal section) and good resistance to water.

Urea and Thio-Urea Resins Differ in Properties

There are two distinct types of Urea moulding powders on the market. The one grade is made from pure Urea, while the other has part of the Urea replaced by Thiourea. Both types have their advantages and disadvantages. The straight Urea powders may be used in ordinary tool steel molds that are in use with the phenol powders, and a higher curing temperature may be used, in the neigh-

(*Continued on page 719*)

Casein and Vegetable Ivory Button Industries Still Compete

Despite Great Disparity in Raw Material Costs, Casein continues to displace natural substance.

By P. Ch. Christensen

President, Aladdinite Co.

IN my position, which has brought me in close touch with the casein and ivory button industries for the past ten years, I have witnessed, with increasing satisfaction, the continuous rivalry for pre-eminence between these two competing materials as to which will survive in supplying the market. Within the past few years, I have seen a steady gain in the proportion of casein buttons that have been manufactured.

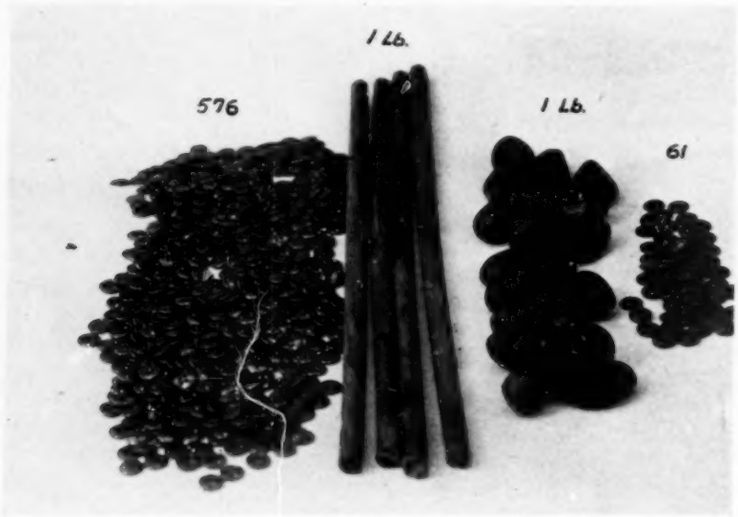
Many Turn to Casein

In time, as the consumers and manufacturers of buttons are reached by a continued educational campaign stressing the merits of casein buttons, more and more button manufacturers will realize that the inevitable trend is the replacement of the ivory button by the casein button.

Such manufacturers as the New Jersey Button Works, 63 Dickerson St., Newark, N. J., Applebee-Neumann Button Co., Inc., 663 Broadway, New York; North American Button Co., Howard and Palmer Sts., Philadelphia, and others have sensed the superior possibilities of the casein button and have confirmed such conclusions by being among the first to enter the field of producing them. They have taken advantage of this pioneering attitude and prepared a foundation upon which they will continue to build up a commanding position as increasing demand persists in causing the replacing of the ivory button by the casein button.

Ivory Wastes Considerable

By way of comparison of the relative waste of raw material in the manufacture of the vegetable ivory button as against that in the production of casein buttons, the reader is referred to the accompanying illustration. This shows one pound of the nuts with the resulting 61 buttons obtained, together with one pound of casein rods with the resulting 576 finished buttons obtained. Although the cost per pound of raw casein rod material is preponderantly more than of raw ivory nuts, there is practically no waste from the casein rods in the course of manufacture. The irregular shapes of the ivory nuts indicates even to the layman that uniform continuous production is virtually impossible. Also, the use of automatic machines, on the development of which many years were spent in Germany where casein buttons have practically replaced ivory buttons, has resulted in low labor costs and vastly increased production. There is no comparison in the relative labor aspects in the finished button costs.



This illustration shows most clearly and graphically the disadvantage ivory faces in button production. The irregular shape of the nuts makes it evident that much material is wasted.

Casein Buttons Stand Tests

Extensive tests have proved that the casein button not only passes all of the required button tests, but does so to an extent far superior to the rating of the ivory button.

Germany, for thirty years, and England, for half that period, have manufactured casein buttons, and the place of the casein button in those countries has been established for years. The impetus given to the casein button in Germany had its effect on England, so that less time was required to prove its superiority in that country. Likewise, the impetus given the industry in England and Germany has, in ten years of manu-

STRENGTH, BEAUTY AND RESISTANCE IN THESE MOLDED PRODUCTS ARE CHARACTERISTIC OF THE SYNTHETIC PLASTICS USED

Bakelite applications, numerous in the field of dental surgery, now include the Lacy Sterilizer. The lustrous black of the molded phenol resinoid is enhanced by contrast with the chromium plated hinges.

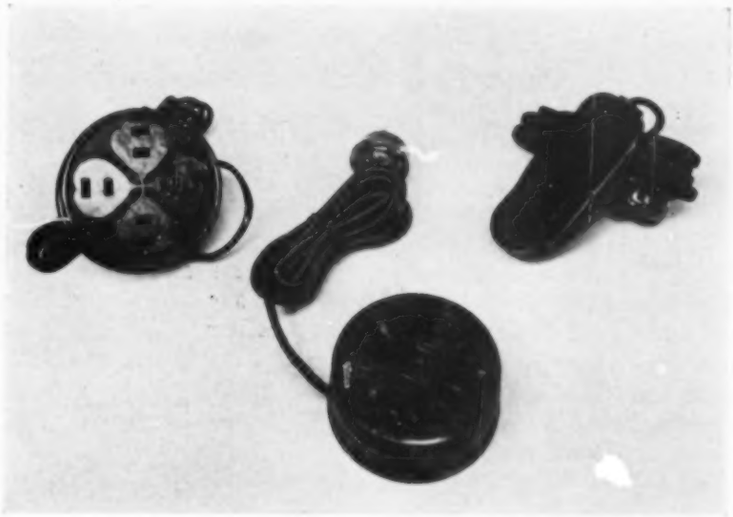
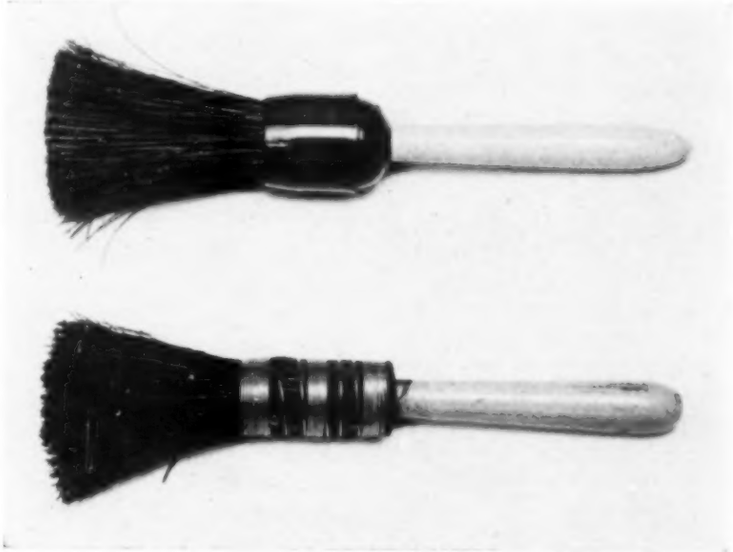


Table taps of Bakelite Molded furnish outlets for electrical appliances, percolator, toaster, lamp, etc., without the nuisance of numerous wires from base or wall plugs, —an electrical utility which adds to the beauty of any room.

A "before and after" picture which illustrates how the "Auto Kleen" brush, of the Specialty Distributing Company of Chicago, has been improved in both beauty and durability by the addition of an unbreakable, molded Bakelite ferrule.



The barber finds this portable electric clipper put out by the Oster Mfg. Co., of Racine, Wisconsin, desirable for many reasons. The insulation properties of the Bakelite molded housing of mottled green render the clipper shockproof, while its lightness, perfect balance, lack of vibration, and resistance to oils, moisture and heat are other advantages.

Photos Courtesy Bakelite Corp.

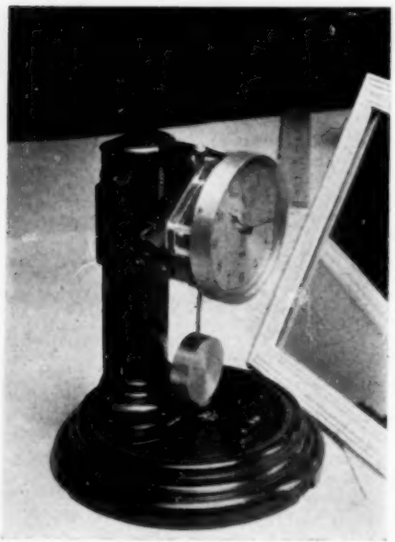
Molding the Clock Case

Synthetic Plastic Molded Cases have proved a boon to the wider merchandising of clocks, both of the electrically operated and spring wound types

By H. S. Spencer
Advertising Manager, General Plastics, Inc.

IF Captain Cuttle were alive today, his loyalty to his frequently regulated chonometer would doubtless be shaken by the wonders of today's time pieces, which avoid the necessity of frequent winding and need of having their hands turned ahead or astern as was the captain's custom.

With the rapidly increasing number of electric battery and central station controlled clocks, it will soon be hard to find anything but electric clocks in the market place. In analyzing the electric clock development, it is hard to determine whether the resinoid materials brought about the electric clock or the electric clock opened a new field for these materials. It is certain however that the phenolic compounds have proved the most desirable of clock case materials.



The base, standard, and several concealed parts in the Poole clock, are molded.

Probably the largest distribution or public acquaintance of phenolic materials in clock cases was the successful marketing of the Artlarms by the New Haven Clock Co., which because of their popular prices and actual art features, together with the completeness of their line comprising a wide range of Durez colors and choice of models held a price range of two to twenty-five dollars. They overcame competition and met a rapid and broad public acquaintance. Though not electrically controlled the New Haven Artlarms did much to educate dealers and the public to molded clock cases as did the popular model of the Western Clock Company placed on the market several years ago.

Widely Sold Electric Clocks Fitted with Molded Cases

Following and gaining acceptance almost at the same time, came the Warren Telechron and Western Clock with Durez and Bakelite cases respectively, and the additional advantages of appearance and accurate time through electric control. Sangamo Electric Company of Springfield, Illinois likewise brought out a very attractive electrically controlled model. In the electric battery control field, the Poole Clock Company, later the Poole Division of Morse Products, Incorporated of Ithaca, New York, developed a large gothic molded case, carrying the mechanism of their notably accurate time piece.

Molded clock cases have proved their permanency in a number of practical ways.

One manufacturer found his molded case sufficiently strong that the weight of a "good, husky man" did not break it, even though the back was not put in place, and while it is not customary for purchasers to stand on clocks to hang pictures, this added strength is a feature in shipping as is the lightness of the material from which the case is formed.

Another model of the Poole battery-controlled clock having also a molded case.

Molding Generally Reduces Cost of Cases

Molded cases may not always reduce costs. Though one outstanding instance is sufficiently convincing to show that they can do this. A handsome clock in a cabinet case was retailed at $50. Slightly redesigned, the number of models reduced, the number of colors increased, the Durez case can be sold with the same profit or approximately it, to everyone involved, and per-

mits a new clock to be placed on the retail shelf at twenty-five to thirty dollars. Needless to say, sales were increased and the change was very impressive to the retailer. The manufacturer feels he is not only selling more clocks but has gained a tremendous value of good will for the molded clock looks as good, if not more attractive than the old model. It is of the same size, has an equally massive appearance with the same works but the price is half.

Some examples of the New Haven Artlarm line of clocks having molded cases.

Clock Assembly Parts Are Also Molded

In addition to the clock itself, there are a number of the actual physical parts of the clock's mechanism which involve molded material such as motor control blocks contact plugs and contact plug shells, mechanism supports, etc., which, if not quite so apparent on the surface, also add to the salability of clocks because of the recognized durability of such molded pieces.

FIRST RETAIL MOLDED WARE SHOP OPENS IN LONDON

BEETLE PRODUCTS SOLD EXCLUSIVELY

The first retail shop in the United Kingdom exclusively devoted to the sale of synthetic resin molded products has just been opened in Regent Street, London, the greatest trade thoroughfare of the metropolis. The establishment is known as "The Beatl Shop," Beatl being the well-known trade name applied to moldings made from the molding powders of Beatl Products, Ltd. The object of the shop is, of course, to sell Beatl moldings to the vast consuming public of London. The establishment made its debut to the accompaniment of a big advertising campaign in the London press. The first ads simply informed the public in large type that "The Beatl Shop is Open," the word "Beatl" being calculated to arouse the curiosity of the public. This psychology proved correct, for those who did not know what "Beatl" was turned up in vast numbers to repair their ignorance.

At the shop they found a display in beautiful colors and effects of the various brands of non-fragile tableware (the reporters described it as "unbreakable china"), cigarette boxes, domestic fittings, ornamental and utility articles, table and pendant lamps, cosmetic containers, dressing table requisites, etc., now produced by various concerns molding Beetle powders. This collective display graphically illustrates the progress being made in this branch of the plastics industry and reflects the value of the Beetle service to molders of these powders. It is the intention of the parent company (British Cyanides Co., Ltd.) controlling Beetle Products, Ltd., to maintain and extend this service, so that molders will find an ever-increasing outlet for their products. This step of opening a shop in the heart of Regent Street, where thousands daily stop to gaze at displays of the world's finest manufactured goods obtained from all corners of the globe should prove a tremendous stimulus to the demand for artistic molded-ware. The establishment has been opened just in time to get the full benefit of this year's Christmas trade, and it is intended during the coming weeks to devote the window to displays of goods suitable for Christmas gifts. Great benefits should be reaped from this, as Regent Street's Christmas trade is invariably enormous.

Current British News Notes

AS the result of amalgamation arrangements, the wiring supplies, lighting engineering. radio, and electric refrigeration business of the British Thomson-Houston Company will be taken over by the Edison Swan Electric Company, and the latter will market the former's products in these lines.

OWING to the diminishing demand for casein combs resulting from shingling and bobbing styles, employers in the comb-making industry in Aberdeen are discussing the question of reduction of wages. It is feared that a serious industrial dispute may develop.

ACETATE Products Corporation has issued a circular assuring stockholders that the firm is in a strong financial position. A new factory is being erected at Croydon and, as soon as completed, the machinery already ordered will be ready for installation. The introduction of a number of new lines should materially increase the firm's turnover and profit. Over 150 people are now employed.

How Record Ventures Are Faring in Great Britain

By A. C. Blackall
British Correspondent

THROUGHOUT the course of the London Stock Exchange boom of 1928 one of the outstanding groups of shares was the phonograph group, and although the boom has now passed, the stocks of the leading companies still remain one of the really active sections of the stock markets. These companies have made large profits and paid handsome dividends, and if the market value of their shares appears to be extraordinarily high there is at any rate some justification for optimism, though it may be dashing a little too rapidly ahead. The same prosperity has not been the lot of the many new phonograph record undertakings that were floated during the boom. Little is now heard of the various companies floated to manufacture unbreakable and pliable records out of new plastic materials last year. The best-known of these companies, the Goodson company, encountered legal as well as technical difficulties in connection with its new flexible these problems will be smoothed record, but still hopes that all out and that a record of a revolutionary nature will be produced from its works before long. Of the various new companies floated for the production of cheap shellac records, some have fared moderately well, while others have suffered more or less severe losses.

Columbia Rise Meteoric

The rise of the Columbia Graphophone Co., Ltd., in England has been meteoric. Its capital, including shares offered in June, 1929, is £1,582,560 ($7,912,800) issued and paid. In 1924 the firm's net profits amounted to £76,367 ($381,835). In 1929, on a capital five times larger, its net profits were £505,121 ($2,525,605), and the percentage actually earned on the ordinary shares after deduction of prior charges but before tax has risen from 38.2 in 1924 to 45.3 in 1929. The company has acquired interests in all parts of the world. It owns 90 per cent of the stock of Columbia (International), Ltd., a controlling interest in an American company and a Japanese company, and twelve months ago completed arrangements with the Compagnie Generale des Machines Parlantes Pathe Freres, of France, for the merging of their businesses in France.

At the firm's annual meeting the chairman, Lord Marks, stated that sales were still expanding virtually all over the globe and that they were materially adding to their factories and or-organizations throughout the world in order to keep pace with the enormous growth.

British Victor Also Enjoys Property

The Gramophone Co., Ltd., the English Victor subsidiary, is the largest British phonograph undertaking in point of capitalization, the issued and paid capital, as increased in June, 1929, standing at £5,300,000 ($26,500,000). Like the Columbia company, it has enjoyed amazing prosperity and progress. In 1924 its net profits after payment of tax amounted to £195,137 ($975,685); for the year ended June 30 they were £1,168,217 ($5,841,085). In 1924 they represented a percentage of 17.4 on the ordinary share capital, in 1929 on the capital (before increase) they represented 84.9 per cent. In 1924 the dividend on the ordinary shares was 15 per cent; in 1929 it amounts to 60 per cent, and the report states that these profits are derived from progressive trading and have not been helped by any unusual credit items. The dividend for last year was 55 per cent. That the company has been able to surpass its profit and dividend of 1927-28, which were until then easy records, may not perhaps have caused stockholders much surprise, as they have grown accustomed to expansion year after year. However, it is noteworthy in view of the very pronounced extent to which this leader in the phonograph record field has stimulated competition.

Vocalian Has Steady Gain

The Vocalian Gramophone Co. is not so large as the two preceding concerns, but it has nevertheless proved very successful and is gradually enlarging its scope. It has an issued and paid capital of £250,000 ($1,250,000). In June of this year it was decided to increase the authorized capital to £350,000 ($1,750,000), so that additional capital would be available at any future time. Before this increase the firm had made an investment in Brownlac, Ltd., and had acquired a controlling interest in the Vincent Manufacturing Co., Ltd., piano manufacturers.

The other side of the picture is evidenced by the results of Dominion Gramophone Records, Ltd., a boom flotation which has just held its first annual meeting and reported a trading loss of £29,570 ($147,850). Although

(*Continued on page 718*)

SCRANTON

The world's largest and newest-equipped moulding plants

Main offices and plant, Scranton, Pa.

Auburn Plant, Auburn, New York

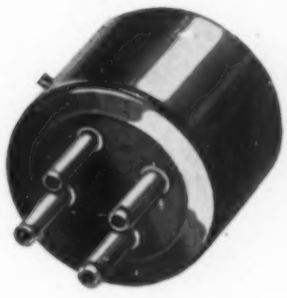
THE AUTOMOTIVE AND RADIO INDUSTRIES DEMAND ACCURATE PRESS WORK QUANTITY PRODUCTION and PROMPT DELIVERY FROM THE CUSTOM MOULDER

The extent to which Scranton Button Co. serves these key industries is testimony that their service is dependable.

From start to finish—from design of the moulds to the actual delivery of the moulded article—whether in Bakelite, Lacanite or Phenolic—the same careful attention is paid to the requirements of all industries.

SCBD

For over forty years, this has been the mark of quality and service in Molded Parts. Whatever you make in which Molded Parts are required, you can place the utmost confidence in Scranton Button performance.



Offices

4900 Euclid Bldg.
Cleveland, Ohio

419 Cherry St.
Scranton, Penn.

40 Washington St
Auburn, N. Y.

The Scranton Button Co.

Scranton, Pennsylvania

Offices

50 Union Square
New York City

645 Washington Blvd.
Chicago, Ill.

114 E. Lawn Ave.
Detroit, Mich.

THE GENERIC NAME ROUND ROBIN

(*Continued from page 705*)

then this article would have been written differently. However, the name "Synthoid" would indicate that they intended to remain on land if not on their feet.

I am asked why I quoted "Chic Sale" — a tongue-tied moulder endeavored to pronounce the name and naturally I thought of Lem Putts' eight holer.

Always for the good of our Industry, and therefore opposed to "Synthoid" or any member of her family,

Sincerely yours,
B. F. Conner, Mgr.,
Plastics Division.
Colt's Patent Fire Arms
Mfg. Co.
Hartford, Connecticut.
Nov. 12, 1929.

To the Editor:

In reply to you letter of November 7th, . . . my frank opinion is that the name "Synthoid" will never get anywhere or amount to anything. For perfectly legitimate reasons, the Bakelite Corporation may not yet be willing for the name "Bakelite" to be used for the thermo-setting plastics. However, if we look a little bit into the future—ten, fifteen or twenty-five years, when all patents on the primary phenol formaldehyde resins, as we know them today, are forgotten —there will probably be a number of different manufacturers producing Bakelite substantially as we know it and having characteristics that are equally as good. It seems to me, therefore, that now would be an excellent time for Dr. Baekeland to accept at this time, the honor that is due him and allow the name "Bakelite" to be used for products that are made from phenol formaldehyde, or closely related materials. I realize that this does not solve the problem which was attempted to get a name which would cover the entire plastics field and embrace not only Bakelite but the thiourea products—Celluloid and other synthetic plastics the years may bring forth. However, I do not believe it is possible to do this. I feel that within the next decade, new plastics will be brought out of which we now have not the slightest conception and that the promoters of these plastics will not conform to any artificial nomenclature which you now attempt to set up.

Yours very truly,
Norton Laboratories Inc.
J. B. Neal, Manager.

Celluloid Corp.
10 E. 40th St., New York City

To the Editor:—

As requested in your letter of November 7, I am very glad to give you my reaction to the word "Synthoid" as a generic term for moldable materials.

In choosing a generic name for all materials which have undergone forming by molding under heat and pressure and also to embrace articles that have been molded from these materials, it seems to me that this name, preferably, should be short—euphonious—one that could be readily remembered, spelled and pronounced, and it should be protectable. The fact that molded articles have widely divergent base materials should automatically bar any name based on the trade name of a specific material or that could in any way suggest or be connected with it.

I feel that the word "Synthoid" is too indicative of artificiality and that it might tend to place the materials or articles molded therefrom into a group classification of the "oid" materials.

A name based on a common property of all molding compounds would offer certain advantages, but it would be decidedly limiting in the application of the word, restricting it to this particular and specific common property. In order to obtain the broadest usefulness or application of a trade name, it is my opinion that it would be better to coin a word which had no other significance or limiting interpretation than would be given to it through subsequent publicity and advertising. Very successful and striking illustrations of this procedure are evidenced in such generic trade names as "Rayon" and "Linoleum" . "Kodak", without publicity, meant nothing, but "Kodak" with the advertising and publicity which has been given it, means a camera to anyone who sees the name.

A coined, generic name, such as "Korox" is one that is not suggestive of any particular type of material—it is easily pronounced and spelled—it is euphonious—and is easily remembered, and it could be made to mean anything and everything that the molding trade desired, this being dependent entirely upon the character and amount of publicity put behind it.

Very truly yours,
Charles F. Reeves.

Karolith Corporation

To the Editor:

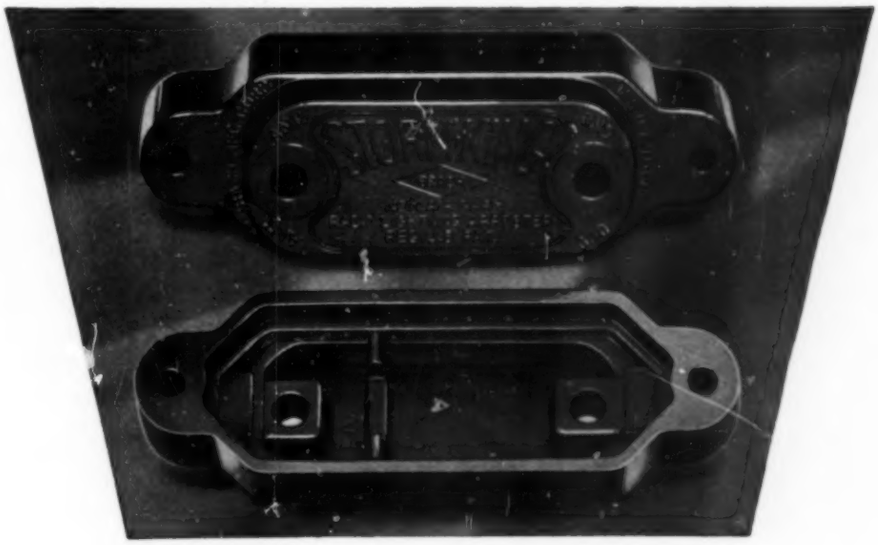
I have your kind letter of November 7th calling my attention to the choice of the word "Synthoid" as a generic expression by the Committee of the Molded Insulations Section. The word "Synthoid" in itself seems to cover the subject matter more broadly than any other words that I have heard thus far. Nevertheless I see no particular advantage in it. Unless I misunderstand the entire purpose that the Committee tried to bring about, I personally would not recommend the choice of a word as a generic expression for after all one has to describe ex-

(*Continued on page 718*)

MOLDED BY GENERAL ELECTRIC

TEXTOLITE MOLDED

This Storm King lightning arrester, with its compact case of Textolite molded, represents the high quality of the small parts custom-molded by General Electric. ¶Molded by G-E technicians to the design of the L. S. Brach Manufacturing Company, this arrester case retains its attractive finish and is highly dielectric and non-hygroscopic. Although relatively simple in design, it reflects the experience and technique gained by General Electric in producing over half a billion moldings.



885-26

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GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

NEWS *of the* INDUSTRY

Durez Exhibits at Niagara

GENERAL Plastics, Inc., North Tonawanda, N. Y., were invited to exhibit their product at the Chemical Industries Exhibit of the Niagara Frontier at the Buffalo Museum of Science, under the auspices of the local section of the American Chemical Society. In a rather large and colorful display, almost every custom molder's output was represented.

Edison Halts Phonograph Record Output

THOMAS A. EDISON Industries, Inc., have announced that the manufacture of phonographs and phonograph records has been abandoned. This has been caused by the great demand for Edison radios, at this time three times the present capacity. Inadequate radio manufacturing facilities are responsible for discontinuing record production.

Allen Brown a Director of National Advertisers

ALLAN BROWN, Manager of Advertising of Bakelite Corporation, was elected a director of the Association of National Advertisers at the meeting of the Association at Swampscott, Mass., October 14th to 16th, and appointed chairman of the committee on finance. Mr. Brown is also vice-president and chairman of the Finance Committee of the National Industrial Advertisers Association, and member of the National Commission of the Advertising Federation of America.

Baekeland Honored

DR. L. H. BAEKELAND was among those awarded the doctorate, honoris causa, upon the occasion of the recent celebration of the 175th anniversary of the founding of Columbia University. The degree conferred was Doctor of Science. Dr. Baekeland, who is president of Bakelite Corporation and Honorary Professor of Chemical Engineering at Columbia University, won his first Doctor of Science from the University of Ghent in 1884. Subsequently, he has received the degree of Doctor of Chemistry, honoris causa, from the University of Pittsburgh, 1916.

DuPont Style Service

PLASTIC materials were used for decoration on some of the important cars at this year's Paris Automobile Salon. In some cases they were employed on the inside of the windows. In others they were used for handles on the doors. A few years ago practically all these handles were of metal, now some of them are of worked metal with an attractive design and still others are of plastic material in black or imitation ivory also imitation onyx in various shades. The effect is very attractive.

In addition quite a number of the handles for raising and lowering the windows were made of pyroxylin materials. Another interesting item was that some of the radiator tops were made of the transparent plastic material called prystal, which seems to have a vogue in France at the present time.

New Lucite Brush

A new utility hairbrush, known as the Lifetime, has recently been placed on the market by the Du Pont Viscoloid Company. The back is of jade colored Lucite ornamented with gold stripings and the bristles

American Insulator Corporation

NEW FREEDOM, PA.

PLASTIC MOLDING

COLD MOLDED AND

PHENOLIC PRODUCTS

Sales Offices:

N. Y.: Graybar Building

Detroit: General Motors Bldg.

Chicago: 9 S. Clinton St.

New Haven: Chamber of Commerce Bldg.

When writing American Insulator Corp., please mention *Plastics*

are a fine grade of imported Siberian stock. These brushes are so constructed that they may be easily cleaned with soap and lukewarm water without injury. They are made in three sizes for men and women and have combs to match.

Molders Notice

DUE to the fact that the Federal Trade Commission has not yet acted upon the Trade Practise Rules presented by the industry at the October meeting, Molded Insulation Section meeting has been postponed from December 2nd until some time in January after NEMA has been advised of the Commission's decision.

News

WHEN the "Graf Zeppelin" arrived at Lakehurst on its round-the-world trip, the Wood Amalgam Co. of Bloomfield, N. J., sent Dr. Eckener a consignment of its 'Wood Amalgam', which was forwarded to the Zeppelin works at Friedrichshafen. A feature of this material, useful in repairing fractures and damages to wood work, is its fire and moisture resisting qualities, making it safe for use in boats and aircraft..

New Molder in Detroit

ACCORDING to reports, another custom molding plant is being organized, in Detroit, Mich. Mr. J. J. Shriver, formerly of Lockport, N. Y., is now located at 1010 Ford Building, in that city, and is planning to begin operations about the first of the year.

Booklet on New Explosion-Proof Motor

THE Louis Allis Co., Milwaukee, Wisc., announces as ready for distribution, a 12 page booklet describing their new "Explosion-Proof" electric motor. It is said to be the only motor of reasonable weight and size approved by the Underwriters' Laboratory for operation in explosive atmospheres.

OUR MOULDED PRODUCTS BEARING THESE TRADE MARKS *Stand For*

QUALITY
DEPENDABILITY
ACCURACY
AND SERVICE

ELECTROSE

The design and construction of moulds, as well as the art of moulding, requires highly specialized skill in producing the finished article.

Insulation Manufacturing Co. has this skill which has been proved by over thirty-five years of custom moulding to the trades.

B

DUREZ

THERMO PLASTIC COMPOUND MAKALOT SYMBOLIZES GREATER PRODUCTION

When you are in the market for moulded articles, we would like to receive your inquiries, which will have our prompt attention.

INSULATION MFG. CO., INC.
GENERAL INSULATE CO., INC.
New York Ave. & Herkimer Street
Brooklyn, N. Y.

Expert Bakelite Molding Requires Perfect Dies, Modern Equipment, Skilled Labor

RECTO

Combines these with a knowledge of molding and an understanding of the correct way to apply this knowledge to your product.

"Remember Recto Does It---Better"

Recto Manufacturing Co.

Appleton Street **Cincinnati, Ohio**

KURZ-KASCH

Plastic Moulding Headquarters

Are specialists in the moulding of articles out of the new light-colored materials

BEETLE and LUMARITH

We are one of the four exclusive moulders selected by the Synthetic Plastics Co., an American Cynamid Co., subsidiary, equipped to mould their powder.

Plant and Executive Office, DAYTON, OHIO

The reputation of Kurz-Kasch moulding has been established by the unflagging zeal of our organization for the finest results. The best materials, equipment and facilities are available, as well as ideal working conditions.

THE KURZ-KASCH CO.

Dayton, Ohio

MOULDERS OF PLASTICS

When writing The Kurz-Kasch Co., please mention *Plastics*

Synthoid Comment

(*Continued from page 714*)

actly what he has in mind even thought he might use the word.

I think speaking of a molded Karolith Humidor or a molded Karolith Lamp Shade, Karolith clock case immediately describes the matter, whereas if the word Synthoid was to be used, it would have to be described anyway. In other words one would have to tell whether he meant molded out of Bakelite, out of Karolith, or out of any other plastic. I, therefore, do not see any advantage in the selection of a generic term.

Yours very truly,
Karolith Corporation,
By: A. S. Zimmerman.

British Record Status

(*Continued from page 712*)

the accounts cover the period of twelve months the company was not in full production until after the turn of the year. G. R. Hall Caine, the chairman (a son of the novelist), declared in his speech that the prospectus had included an estimate of an annual profit of £60,000 ($300,000). The directors found, however, that other new competitors were coming into the field, and that those firms already established had spent hundreds of thousands of pounds in becoming so. Other factors—the high cost of material and the building of an up-to-date factory at Luton—have contributed to the present position.

PLASTIC
MOLDING

Producers of the finest
in Molded Parts for
thirty-seven years

Shaw Insulator Co.
Irvington, N. J.

SHAW

When writing Shaw Insulator Co., please mention *Plastics*

"It is of vital importance for us to have more working capital," said Mr. Hall Caine. "A further £50,000 should put the company on the high road to success. Without it the prospects of the company will be extremely serious. The company has definitely established itself and, despite the trading loss, is worth £8,000 ($40,000) more than when it started a year ago."

The Dominion record sales are now steadily increasing and the cost of production has been reduced to a figure which, on the basis of present sales, will yield a profit which will tend to increase as sales increase.

Urea Resins

(*Continued from page 707*)

borhood of 330 degrees F. The Thio resins, however have greater resistance to boiling water, but are more expensive, due to the addition of the Thio, and the necessity of using stainless steel or Chromium plated dies are points against them. This use of stainless steel is brought about by the action of the Sulphur, present in the Thio, which will attack ordinary steel under the action of heat.

The Future

What are the possibilities for these new Urea-Formaldehyde powders? And will they compete with the Phenols? These are questions that are so often brought up, that a few notes on the subject may be of interest.

There is no doubt that both the phenols and the urea-formaldehyde powders have their own spheres of usefulness, and there is not likely to be as much overlapping as might first seem apparent. Where utility rather than color effect is of main importance, the phenols will stand

MOULDERS OF PLASTICS & BUILDERS OF MOULDS

An aileron pulley and a wire spacer, molded out of the new, strong, canvas-base Bakelite material

KUHN & JACOB
MACHINE & TOOL CO.
TRENTON ~ ~ ~ ~ N.J.

THE SIEMON COMPANY

BRIDGEPORT, CONN.

An organization with 26 years of experience behind it, well qualified as custom moulders. We solicit your inquiries on

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When writing these advertisers, please mention *Plastics*

without competition. A less highly paid type of labor may be used, less care is needed in keeping the place clean, with the consequent reduction in rejections, and there is a bigger latitude of curing time. Moreover, the cost of the raw materials, at the present time, anyway, is all in their favor.

Many Compensating Points In the New Powders

In the lighter shades, however, the urea-formaldehyde powders are likely to cause some transfer of patronage. The molded article, in urea-formaldehyde, is considerably stronger, there is little difference in the cost of the powders, and so, where a saving in material can be effected while keeping the same strength, a thinner wall in urea-formaldehyde can be used and thus reduce the cost of material below the phenol costs.

It is, however, in the pastel shades that the urea-formaldehyde resins are going to open up a new field to the molding industry, at the expense of molded and pressed glass, porcelain, lacquered wood, celluloid, marble, ceramic, onyx, casein, and many other materials. One of the largest immediate markets is undoubtedly in the toilet goods field. For jars and pots for face creams etc., in lieu of pressed glass and tin, and for every kind of box, where the appearance and finish of the container adds so greatly to the sales appeal, urea-formaldehyde molded products with their complete rainbow line of colorings have tremendous possibilities. Another line, covering sanitary fittings such as toilet seats, wall tile, offers large volume, and a great potential output.

Manufacturers Must Sell Their Products

One only has to talk the matter over with a molder, and he will be the first to acknowledge the possibilities of pastel shaded moldings, but a common remark in the trade is that the molders job is to sell a molding service, and not a molding material. Already several of the more pro-

gressive concerns are running small jobs as an experiment, but, considering the fact that these new materials have only been on the market for less than a year, it is amazing how much interest is being displayed.

It is not only the molders, who are displaying this interest, but a large number of potential users, who have never before shown any interest in the molding industry for their particular business. Such signs speak well for the future of urea-formaldehyde molding powders.

Casein and Ivory Buttons

(*Continued from page 708*)

facture, proved the superiority of casein buttons in this country.

You may have noticed that the bulk of the high grade imported suitings and overcoats are adorned with casein buttons, to give that bright, deep-lustrous, finish to their trimmings. It is to give that feeling of satisfaction to the wearer, that the best in buttons is applied to the garment.

The casein button in addition to its superiority in specifications, its non-inflammable character, has that delightful smoothness and lustrous gleam. It comes in rich hues, of semi-translucent color, with rich- deep lustrous finish. In buttoning the garment on which they are used, you feel perfect workmanship which has made the edges as smooth as polished ebony.

The buttons of all kinds made and sold in this country amount in value to several million dollars yearly and, considered from all angles, at least 50% of this business will ultimately be replaced by the casein button. I am not reluctant to state that within four or five years, even this percentage will have increased. However, with all justice to the high technique and economies at present available, I feel that the art of casein button manufacture is capable of further refinements which in time will place the industry on the high plane that it so justly deserves.

What Price Experience?

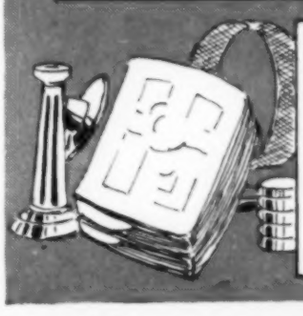
BILLIONS of dollars have just been paid by stock market operators for experience. What a price! What an irreparable loss!

Norton Laboratories have the engineers whose experience is at your command to guide you in your moulding problems. You do not have to pay for this experience. We have paid for it long ago. You do not have to waste time, effort, and money to pay. We are ready to help you—to give you the benefit of real experience gained over a period of years.

Tell us your problems. Norton Engineers will help you solve them.

NORTON LABORATORIES, INC.
LOCKPORT, N. Y.
Moulders of Bakelite and Durez

Norloc



Norton Laboratories
Dept. P 12
Lockport, N. Y.
Gentlemen:

We are interested in Norloc moulding experience. Send complete information without obligation.

Signed Co. .....
Individual Interested .....
Street Address .....
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Cavagnaro, John J., ...685
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BOONTON, N. J.
QUALITY CUSTOM MOLDING OF BAKELITE

DIEMOULDING PRODUCTION COMPANY
CANASTOTA, N. Y.
Bakelite Moulded With Engineering Service

Exports of United States Pyroxylin Products, By Countries

August, 1929

Countries	Sheets, rods, or tubes		Manufactures	
	Pounds	Dollars	Pounds	Dollars
Austria	249	140	.....	.....
Belgium	.....	.....	16	40
France	5,013	551	.....	.....
Germany	4,494	4,686	848	843
Italy	1,177	1,619	10	111
Netherlands	4,485	4,825	33	204
Switzerland	.....	.....	15	116
United Kingdom	62,478	38,970	121,138	19,110
Canada	93,795	67,863	25,918	41,602
B. Honduras	.....	.....	3	10
Guatemala	.....	.....	85	282
Honduras	.....	.....	44	154
Nicaragua	.....	.....	303	878
Panama	.....	.....	209	418
Salvador	13	19	118	460
Mexico	520	478	4,473	6,129
Newfoundland & Labrador	.....	.....	128	159
Jamaica	.....	.....	40	53
Cuba	490	474	813	2,028
Dom. Republic	20	23	20	53
Netherland W. Indies	163	163	.....	.....
Argentina	.....	.....	299	873
Bolivia	.....	.....	607	345
Brazil	.....	.....	73	202
Chile	34	44	500	765
Colombia	45	73	684	1,551
Peru	355	301	.....	.....
Venezuela	.....	.....	130	375
B. India	.....	.....	25	57
B. Malaya	.....	.....	13	28
China	.....	.....	18	36
Japan	1,278	1,300	.....	.....
Philippine Islands	824	853	480	987
Australia	472	322	3,351	3,907
New Zealand	.....	.....	788	1,390
Total	175,905	122,704	161,182	83,166
Shipments from U. S. to:				
Hawaii	85	84	802	644
Porto Rico	.....	.....	556	912

78
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43
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29
59
53
28
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73
45
02
65
51
..
75
57
28
36
..
87
07
90
66

44
12